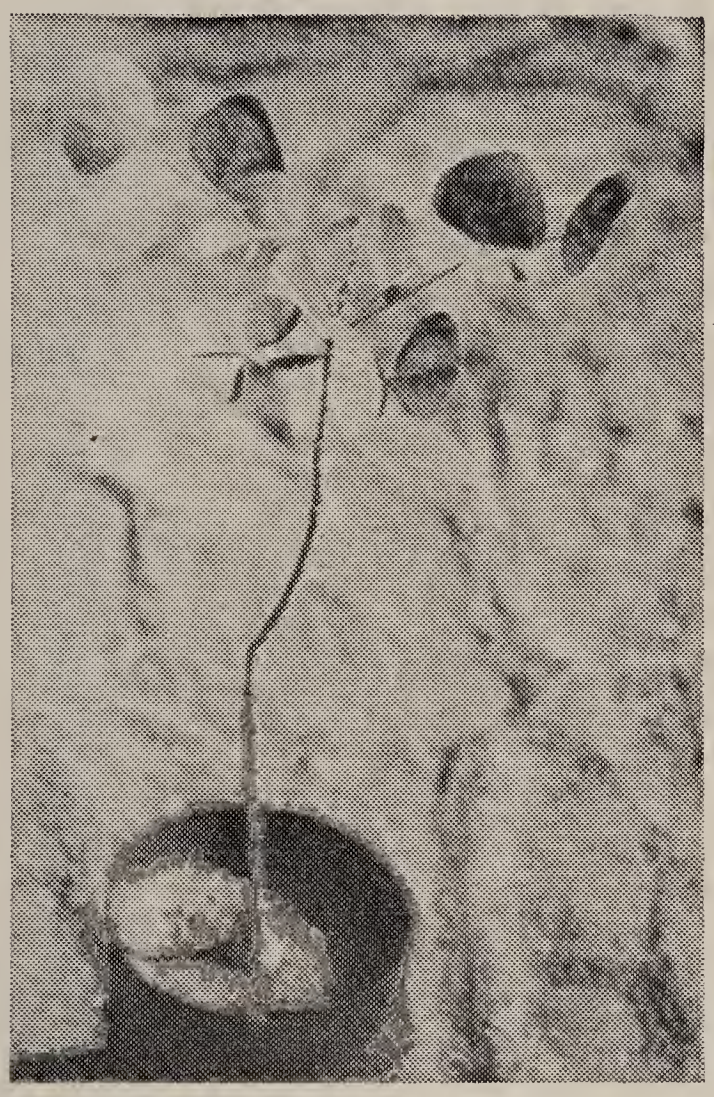
SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVIII January, 1964 No. 1



Two-year-old seedling of *Erythrina flabelliformis*. Note the swollen trunk base

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona. P. O. Box 5415, Phoenix 10. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor

Volume XVIII JANUARY, 1964 No. 1

Arizona Cactus and Native Flora Society

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Desert Botanical Garden of Arizona

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GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

NOTES FROM THE CORNER OF THE EDITOR'S DESK

SAGUAROLAND BULLETIN format for 1964 will have, when possible, the following make-up: a recently introduced shrub to the Garden by our horticulturist, John Weber; an article with photos of an Arizona cactus; an Arizona wildflower; post-card story of one of the National Monuments in Arizona; a story by one of our members.

The Bulletin welcomes articles relative to cactus and succulents and the growing of them in our southwest.

17TH ANNUAL CACTUS SHOW entry list will be mailed to all of the previous exhibitors this month and will also be printed in the next Bulletin. The list is also being mailed to Garden Clubs in the state and to all newspapers and western magazines.

Prospects for this show appear quite favorable and the interest at present time indicates a bigger show.

1964 CALENDAR OF ACTIVITIES is printed in this issue of the Bulletin. It had been inserted in the December issue but many requests have been made to have it reprinted. This is the first time that the Garden has made available to its members and the public a full year's calendar of activities. Many persons are not aware of the varied recreational and educational events at the Garden until they appear in a compiled form and this should tend to increase the Garden attendance.

WINTER CLASSES in "Identification of desert plants and their use in landscaping" will begin Jan. 8th, 3 P.M. in the Webster Auditorium. Attendance of members and other interested persons ranges from 35-50 each Wednesday afternoon. Registration for the fall course was 65 persons, about one-third were from out of state. The last class will be an all-day field trip to Coon Bluff and Saguaro Lake.

NEW STAFF MEMBER Larry Kellner started with us last November. He formerly was with the National Monuments in Arizona and spent considerable time at Saguaro National Monument, Tucson. He has been busy the past month making up educational exhibits, helping with weekly lectures and in the Bookstore. His help will certainly cut down on your editor's load. Do stop in and make his acquaintance. You'll enjoy his quiet manner and knowledge of the desert's inhabitants, flora and fauna.

A new educational exhibit placed in Auditorium

ERYTHRINA FLABELLIFORMIS — Kearney LEGUMINOSAE
CHILICOTE, CORALINA
CORAL BEAN

By John H. Weber, Horticulturist

4′ tall plant in native habitat—note dead stems

DESCRIPTION:

ERYTHRINA FLABELLIFORMIS is a single or multiple stemmed shrub or tree. In the northern limits of its range, it is reduced to a basal branching woody shrub by repeated cold damage. In the protected arroyos and barrancas of Mexico, it attains tree form with a basal trunk diameter in excess of 25 cm. Height under optimum conditions may reach nine meters. The light brown or gray bark is marked with longitudinal white lines. Armament consists of hooked spines along the branches and soft spines along the rachis on the under side of the leaflets. The root becomes woody and tuberiform where the plant is limited to shrubby growth. Leaves are pinnately compounded with three leaflets, 4 to 7 cm. long and 5 to 9 cm. wide. Leaflets are triangular or fan-shaped with rounded angles and are gray-green or light green in color. These are drought deciduous and are present after the summer rains commence. In May the red flowers appear in many flowered racemes. The banner petal is 4 to 6 cm. long and the stamens are partly exerted. The pod, containing several to many seeds, is from 15 to 30 cm. long and 1 cm. thick. Maturing in the Autumn months, the beans are bright red, measuring 12 to 14 mm. in length and 10 mm. in width. These are reported to be poisonous.

DISTRIBUTION:

Coral-bean ranges from southeastern Arizona into southwestern New Mexico and south into northern and northwestern Mexico. Locally, it is found in Co-

Erythrina flabelliformis flower and fruit

chise, Santa Cruz, and Pima counties, being quite common from Pena Blanca west into the Baboquivari mountains. In New Mexico the plant grows in Grant and Hidalgo counties. Ranging in Mexico from Chihuahua across Sonora into Baja California, it is also found in the states of San Luis Potosi and Morelos. In tree form it is frequently encountered in the Rio Mayo Basin. ERYTHRINA ranges in elevation from 400 to 1600 meters occupying rocky slopes, foothills, washes, and canyons. In common association with the coral-bean are MIMOSA LAXIFLORA and EYSENHARDTIA Sp. within the upper desert, desert grassland, and oak woodland.

UTILIZATION:

In areas where temperatures fall below the freezing level, ERYTHRINA would best be employed as a tubbed or planter specimen. In protected sites it could be installed directly in the ground as an accent plant, however, it would have little value as a basic foundation shrub. The heavy spine armament will limit its use in confined quarters.

CULTURE:

Coral-bean requires a well-drained soil and a frost free or protected site. Weekly irrigations are necessary during the Summer months in order to maintain the plant in a leafy condition. Light nitrogen fertilization or mulching with barnyard manure in the Spring will aid new growth and recovery from frost damage.

PROPAGATION:

Propagation by seed requires pretreatment to break seed coat impregnability. Mechanical scarification or treatment with acid or hot water will achieve this end. In the seedling stage, coral-bean is subject to damp-off. Germination is rapid with a moderate growth rate thereafter. Plants are best grown in containers until a root system is well developed then installed in the ground.

REMARKS:

The seed of ERYTHINA is similar to those of the genus SOPHORA in color and appearance and many species of both genera have seeds containing poisonous fractions.

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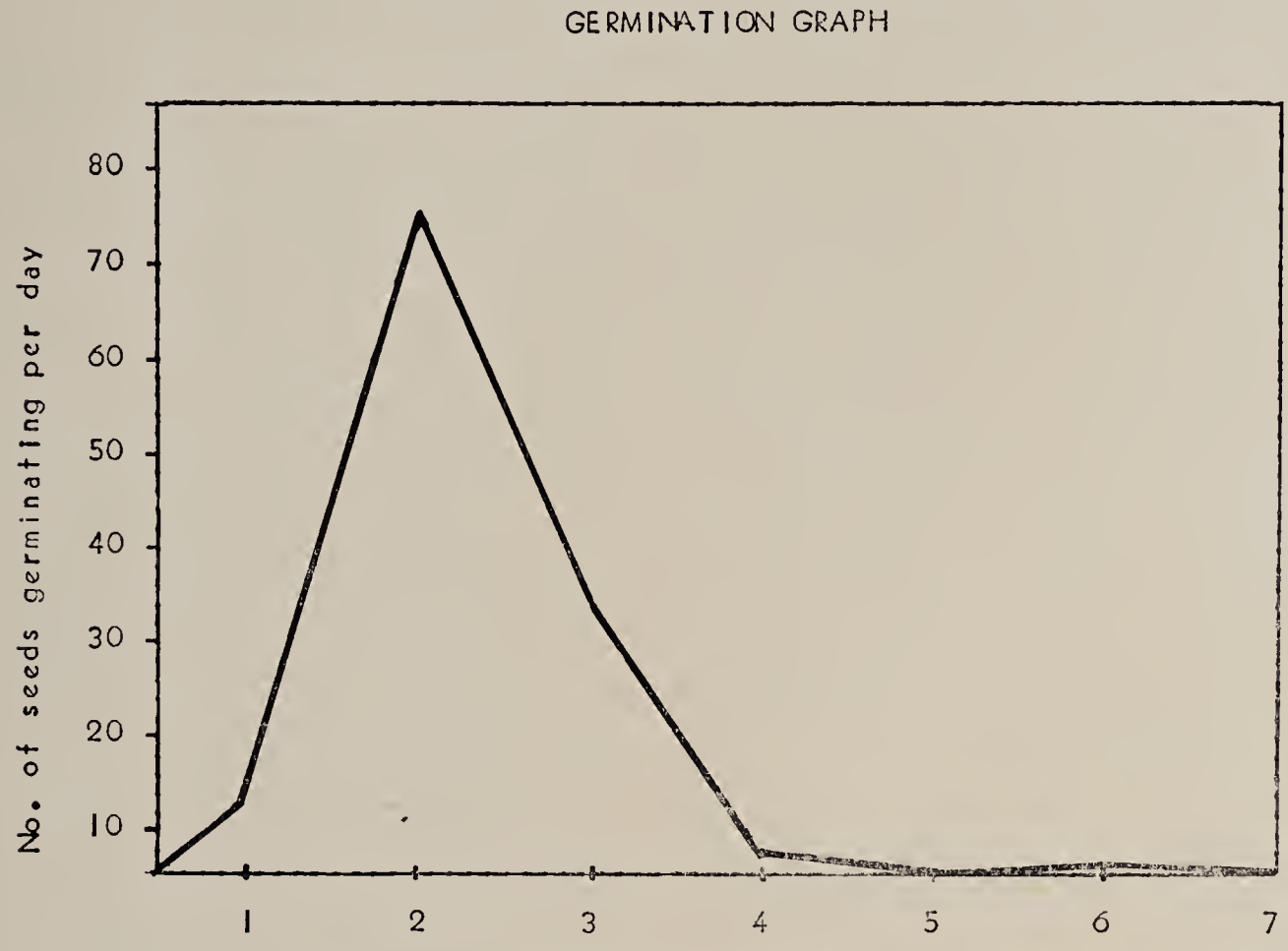
Kearney and Peebles—Arizona Flora.
Little, E. L. Jr.—Southwestern Trees.
Standley, Paul C.—Trees and Shrubs of Mexico.

NATIONAL MONUMENTS IN ARIZONA

CASA GRANDE (Big House) was probably built about 1300 A.D. by the Pueblo Indians. This four storied unreinforced clay building was used as a watch tower and its 11 rooms formed apartments. The Monument is located two miles north of Coolidge and 56 miles S/E of Phoenix. It became a National Monument in 1918 and later a large roof was constructed to protect the ruins from the elements.

GERMINATION STUDIES OF CERCIDIUM FLORIDUM— A DESRT PERENNIAL*

By Hal A. Cuff



Refer this chart to paragraph "Results & Discussion" of last month's Bulletin

One interpretation of germination rate was based on the **total number of seeds germinating in all replications** (540 seeds) which was obtained by counting all of the seeds germinating under each treatment and then totaling them.

Germination rate interpreted on the basis of total seed germination for all treatments:

Scarified seeds	123 seeds germinating	22.8% of total 540 seeds
Non-scarified seeds	12 seeds germinating	2.2% of total 540 seeds
Frozen seeds	65 seeds germinating	12.0% of total 540 seeds
Non-frozen seeds	70 seeds germinating	13.0% of total 540 seeds
Water	60 seeds germinating	12.8% of total 540 seeds
Extract	66 seeds germinating	12.2% of total 540 seeds
Light	70 seeds germinating	13.0% of total 540 seeds
Dark	65 seeds germinating	12.0% of total 540 seeds
Total	540	

* Continued from Vol. XVII, No. 10, page 120 (December 1963).

On the basis of this data it is obvious that the water impervious coats of Cercidium seeds are the single greatest cause of their low germinability, during the first growing season after being shed from the parent plant. In otherwords, low germinability is not the result of a dormant or dead embryo, but rather lack of water penetration of the seed coat. The data shows well that once the seed coat barrier was overcome by scarification the embryos of the majority of seeds so treated, will germinate immediately.

Keeping in mind that this is a rather small example on which to base any concrete conclusions, one is yet tempted to speculate that the overall germination curve obtained here, closely approximates what occurs in the field. That is to say that **Cercidium** seeds must, like other desert seeds, be able to quickly establish the seedling stage, once germination is initiated.

It does not seem unreasonable to expect that some Palo verde seeds have thicker seed coats than others. Thin coated seeds would germinate first while thick coated seeds would be suppressed. The rigorous process of natural selection would favor survival of those individuals which quickly establish themselves, as desert conditions are optimum for only a few days at most.

Those seeds which did not germinate at all had seed coats which were thick and water impermeable. This statement agrees with Went's (1961) observations of **Cercidium aculeatum** in which he reported that the seeds of **Cercidium aculeatum** could be left for years in petri dishes on moist filter paper, and still not germinate. As soon as the stone-hard seed coats were broken or filed, germination occurred within one day. Apparently, under natural conditions **Circidium** seeds require either mechanical scarification or biological deterioration of the seed coat, in order was water imbibition to occur and the embryo to be activated. Such devices act as mechanisms for the preservations of the species, because even after long periods of unfavorable weather, some seeds still survive to establish the species: This means that the seed germination rate curve from year to year is more nearly a straight line than it would be if it strictly followed the seed production curve (identical seed production and seed germination rate curves would result only if thin coated water permeable seeds were produced).

The percentages of seeds germinating under all other treatments (frozen, non-frozen, extract, water, light, dark), showed no significant differences in rate of germination. In fact, they were conspicuous only by the similarity of their germination rates.

A second interpretation of the data was made on the basis of the germination rates of **individual treatments.** Since a total of 160 seeds underwent each treatment, the germination percentages were based on 160 seeds.

Germination rates interpreted on the basis of individual treatments.

Scarified seeds	76.9% germinated	23.1% failed to germinate
Non-scarified seeds	7.5	92.5
Frozen	40.6	59.4
Non-frozen	43.8	56.2
Water	43.1	56.9
Extract	41.3	58.7
Light	43.8	56.2
Dark	40.6	59.4

Once again seed coat scarification obviously had the greatest impact on seed germination. Results obtained for frozen seeds vs. non-frozen seeds and seeds in light vs. seeds in dark showed somewhat more significant results than were indicated in the first interpretation.

Temperature Depression. The second interpretation of data indicates that freezing seeds, even though in the dry condition, might effect their germinability. For example, out of a total of 160 seeds in this lot, freezing resulted in a 40.6% rate of germination while a 43.8% rate of germination was obtained for non-frozen seeds. The results of this interpretation, if considered to be significant, would be in opposition to the findings of Pack (1921) as mentioned by Blake (1935). Blake states, "Pack felt that the freezing of certain seeds in dry storage probably tends to accelerate the processes which cause a seed to break dormancy and respond to conditions favorable to growth."

Light. Interpreting the light vs. dark test was hazardous, even though the results appeared to approximate those found for the freezing treatment. That is, 43.8% of the seeds germinated in the light while only 40.6% of the 160 seeds germinated in the dark. Light vs. dark however, was only important in this experiment as an indirect effect, the direct effect being temperature differences. A centigrade thermometer placed beside the germination chambers showed the darkened chambers to be 3 to 5° C. cooler than the lighted chambers.

Consequently it was felt that the light vs. dark results obtained in this experiment must be interpreted as strictly a temperature effect. Further work using more carefully controlled environments should be carried out on this phase. It is quite possible that light does effect the germination rate of Palo verde. No doubt, a field investigation of **Cercidium** stands during the germination season would also be of value for interpreting the importance of light to the establishment of this species.

Antibiosis. Some of the first work done on antibiosis was carried out by Pickering (1917). At that time he stated, "It has now been established with a reasonable amount of certainty that the deleterious effect of one growing plant on another is a general phenomenon."

Went (1942) first noted what he thought to be antibiosis in **Encelia farinosa.** He stated that although **Encelia** is a shrub of comparable size and density to **Franseria,** it does not harbor annuals as does **Franseria.** Since the unfavorable effect of **Encelia** appears not to be due to microclimatic conditions, Went suggested that there may be a specific material given off by the shrub. Bonner (1948) while studying the problem in **Encelia** (suggested by Went) discovered the inhibitory compound to be 3-aldehydo-4-methoxyacetophenone. He postulated that the presence of this growth inhibitor in the leaves of **Encelia** may have ecological importance in relation to the fact that only a few specimens of desert annuals are to be found growing in close relationship with **Encelia.** Since organic matter from most shrubs provides a medium favorable for the growth of shrub associated annuals and since dry **Encelia** leaves retain their toxicity for a period of many months, there may be a definite antibiotic influence in desert communities containing **Encelia.**

It was with the afore mentioned studies in mind that one treatment in this series was devoted to a germinability test using **Encelia** extract. Water, was used as a control in a number of petri dishes equivalent to the number of dishes containing extract.

The data indicated that water vs. extract treatments were very close in germination rates. This is evident from the fact that 43.1% of the 160 seed lot germinated in water and 41.3% germinated in the **Encelia** extract. It was felt that the difference between these two

treatments was not significant in this experiment.

Certainly it is important to point out that some seeds in each of the four treatments germinated. Some non-scarified seeds germinated, indicating that in nature seedlings could be produced the first growing season, if sufficient moisture were available. Many frozen seeds germinated even after being kept at -10° C. for 10 days, which is well below any temperature desert seeds will experience in Arizona. Germination of these frozen seeds indicated the ability of **Ceridium floridum** to survive unusually cold winters. The germination of seeds in the **Encelia** extract was especially interesting, since many domesticated plants tested by Bonner (1948, 1950), as well as many desert annuals appeared to show inhibited seed germination or even death in the presence of only minute amounts of **Encelia** debris. **Cercidium** seeds germinated in water and **Encelia** extract were potted out and placed in the greenhouse to see if inhibition would occur at a later stage in the seedlings life cycle. **Cercidium** seedlings up to four weeks old appeared to be no more affected by **Encelia** extract than the controls which were germinated and grown in water. It was therefore concluded that the desert shrub **Encelia farinosa** does not exert any great influence upon the germination and establishment rate of **Cercidium floridum** (this probably holds for most of the other desert perennials as well).

Conclusions

The purpose of this project was to make as many probes into the environmental factors afecting the seed germination of **Cercidium floridum** as time would allow. It is recognized that there is a need for several replications of these treatments before concrete conclusions and statements regarding them can be made. This research project was only able to investigate a few of the probabilities, which it is hoped may open some new areas of inquiry, and stimulate further interest in the problems of perennial seed germination in the Arizona desert.

Forrest Shreve (1910) has said, "A fuller knowledge of the germination and behavior of seedlings together with a more complete knowledge of the periodicity of certain climatic elments within its range will be sure to throw light on any fall or rise in the rate of species establishment."

On the basis of data obtained in this experiment, together with the findings of other researchers in the area of perennial seed germination, certain conclusions were reached regarding **Cercidium floridum**, as follow:

(1) Degrees of seed coat imperviousness to water result in an initial high rate of seed germination, followed by a relatively quiescent period in which the seed coats of the remaining seeds gradually become permeable to water through various natural means.

(2) The water impervious coat of desert perennial seed is the greatest barrier to its germination. Once this is overcome, the embryos are almost always found to be viable.

(3) Frozen seeds retained their ability to germinate and produce even after 10 days at -10° C. Freezing may tend to make seed coats more impervious to water or induce dormancy in the embryos of certain seeds.

(4) Light vs. dark results were inconclusive due to temperature variations, therefore further work is required.

(5) **Encelia** extract of the nature and concentration used in this inves-

(5) tigation does not inhibit **Cercidium floridum** germination or seedling development.

(6) Several additional replications of the treatments carried out in this experiment are necessary to furth-

er substantiate the above conclusions.

Summary

Seed coat impermeability in **Cercidium** is the primary reason the seeds fail to germinate. The embryo of the Blue Palo verde seed can with-stand extreme depressions of temperature in the dry state. **Encelia** extract did not show antibiosis in either germination or seedling development of **Cercidium floridum.** Further investigations of light responses are suggested.

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1964 CALENDAR OF EVENTS

DESERT BOTANICAL GARDEN OF ARIZONA
in Papago Park
6400 E. McDowell, Phoenix, Arizona

GARDEN is open daily 9:00 A.M. - 5:00 P.M. including weekends and holidays.

Free illustrated LECTURES are given each Thursday at 3:00 P.M. and Sundays at 3:00 and 4:00 P.M.

CLASSES in a "Better understanding and the use of desert plants for landscaping use" are held each 6 weeks during the fall, winter, and spring on Wednesdays at 3:00 - 4:00 P.M. There is no charge for enrollment.

1964 CALENDAR OF ACTIVITIES is as follows:

JANUARY

2 3 P.M. Lecture—Arizona Wildflowers
5 3&4 P.M. Lectures—Arizona Wildflowers
7 8 P.M. Cactomaniacs
8 3 P.M. Class—Deserts: How Formed and Their Plants
9 3 P.M. Lecture—Arizona Trees and Shrubs
12 3&4 P.M. Lectures—Arizona Trees and Shrubs
15 3 P.M. Class—Desert Succulent Plants
16 3 P.M. Lecture—Arizona Birds and Animals
19 3&4 P.M. Lectures—Arizona Birds and Animals
22 3 P.M. Class—Culture of Desert Succulent Plants
23 3 P.M. Lecture—Arizona Scenics
26 3&4 P.M. Lectures—Arizona Scenics
29 3 P.M. Class—Identification of Arizona Trees and Shrubs
30 3 P.M. Lecture—Succulent Plants Other Than Cacti

FEBRUARY

2 3&4 P.M. Lectures—Arizona Cacti in Bloom
4 8 P.M. Cactomaniacs
5 3 P.M. Culture of Desert Trees and Shrubs
6 3 P.M. Lecture—Collecting Plants in Mexico

9 3&4 P.M. Lectures—Arizona Wildflowers
12 9:30 A.M. Class—All day desert field trip
13 3 P.M. Lecture—Arizona Birds and Animals
16 3&4 P.M. Lectures—Arizona Birds and Animals
23—March 1 9 A.M. - 5 P.M. 17th Annual Cactus Show

MARCH

1 9 A.M. - 5 P.M. Larst day of 17th Annual Cactus Show
3 8 P.M. Cactomaniacs
4 3 P.M. Class—Deserts: How Formed and Their Plants
5 3 P.M. Lecture—Arizona Wildflowers
8 3&4 P.M. Lectures—Arizona Cacti in Bloom
11 3 P.M. Class—Desert Succulent Plants
12 3 P.M. Lecture—Arizona Trees and Shrubs
15 3&4 P.M. Lectures—Arizona Wildflowers
18 3 P.M. Class—Culture of Desert Succulent Plants
19 3 P.M. Lecture—Arizona Birds and Animals
22 3&4 P.M. Lectures—Arizona Birds and Animals
25 3 P.M. Class—Identification of Arizona Trees and Shrubs
26 3 P.M. Lecture—Arizona Scenics
29 3&4 P.M. Lectures—Collecting Plants in Mexico

APRIL

1 3 P.M. Class—Culture of Trees and Shrubs
2 3 P.M. Lecture—Succulents Other Than Cacti
5 3&4 P.M. Lectures—Arizona Cacti in Bloom
7 8 P.M. Cactomaniacs
8 9:30 A.M. Class—All day desert field trip
9 3 P.M. Lecture—Arizona Cacti in Bloom
12 3&4 P.M. Lectures—Arizona Wlidflowers
16 3 P.M. Lecture—Arizona Wildflowers
19 3&4 P.M. Lectures—Arizona Trees and Shrubs
23 3 P.M. Lecture—Arizona Trees and Shrubs
26 3&4 P.M. Lectures—Arizona Birds and Animals
30 3 P.M. Lecture—Arizona Birds and Animals

MAY

5 8 P.M. Cactomaniacs

OCTOBER

5 8 P.M. Cactomaniacs

NOVEMBER

2 8 P.:M. Cactomaniacs
4 3 P.M. Lecture—Arizona Cacti
5 3 P.M. Lecture—Arizona Cacti
8 3&4 P.M. Lectures—Arizona Cacti
11 3 P.M. Class—Desert Succulent Plants
12 3 P.M. Lecture—Arizona Wildflowers
15 3&4 P.M. Lectures—Arizona Wildflowers
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25 3 P.M. Class—Identification of Trees and Shrubs
26 3 P.M. Lecture—Arizona Birds and Animals
29 3 P.M. Lecture—Arizona Birds and Animals

DECEMBER

2 3 P.M. Class—Culture of Trees and Shrubs
3 3 P.M. Lecture—Arizona Scenics
6 3&4 P.M. Lectures—Arizona Scenics
9 9:30 A.M. Class—All day desert field trip
10 3 P.M. Lecture—Succulents Other Than Cacti
13 3&4 P.M. Lectures—Succulents Other Than Cacti
17 3 P.M. Lecture—Collecting Plants in Mexico
20 3&4 P.M. Lectures—Collecting Plants in Mexico
24 3 P.M. Lecture—Arizona Cacti in Bloom
27 3&4 P.M. Lectures—Arizona Cacti in Bloom
31 3 P.M. Lecture—Arizona Wildflowers

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VOL. XVIII February, 1964 No. 2

Succulent arrangement against the wall.
1963 Cactus Show
by Mrs. E. S. Tanner

REG MANNING

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Desert Botanical Garden of Arizona

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GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

SEVENTEENTH ANNUAL

CACTUS SHOW

FEBRUARY 23rd TO MARCH 1st, 1964

Sponsored by the Phoenix Gazette and the
Desert Botanical Garden

Webster Auditorium
Papago Park,
Phoenix, Arizona

SHOW OPEN DAILY 9 A.M. TO 5 P.M. — ADMISSION FREE

A portion of the potted Cacti specimen plants and Desert Paintings in the 1962 Cactus Show.
Photo—Bernard Lewin

CLASSIFICATIONS

SECTION I **CACTI**

Class A. **POTTED PLANTS**

Div. 1. OPUNTIA
2. CEREUS
3. ECHINOCEREUS
4. REBUTIA
5. CHAMAECEREUS
6. LOBIVIA
7. ECHINOPSIS
8. ARIOCARPUS
9. STENOCACTUS
10. FEROCACTUS
11. ECHINOCACTUS
12. GYMNOCALYCIUM
13. ASTROPHYTUM
14. THELOCACTUS
15. ECHINOMASTUS
16. CORYPHANTHA
17. MAMMILLARIA
18. EPIPHYLLUM
19. SEEDLINGS
20. ANY OTHER SPECIES*

Class B. **CRESTED PLANTS**

Div. 1. Crested Cacti — own root
2. Crested Cacti — grafted

Class C. **MONTROSE PLANTS**

Class D. **GRAFTED PLANTS**

Class E. **COLLECTIONS** — 5 species of a genus

SECTION II **SUCCULENTS OTHER THAN CACTI**

Class A. **POTTED PLANTS**

Div. 1. AEONIUM
2. AGAVE
3. ALOE
4. BRYOPHYLLUM
5. CRASSULA
6. DUDLEYA
7. ECHEVERIA
8. EUPHORBIA
9. GASTERIA
10. HAWORTHIA
11. KALANCHOE
12. LITHOPS
13. MESEMBRYANTHEMUM
14. PLEIOSPILOS
15. SEDUM
16. STAPELIA
17. YUCCA
18. ANY OTHER SPECIES*

Class B. **COLLECTIONS** — 5 species of a genus

*Additional divisions will be set up when 3 or more species of a genus are entered.

SECTION III **DESERT TREES AND SHRUBS**

Div. 1. TREES
2. SHRUBS
3. DESERT BONSAI
4. ANY OTHER DESERT PLANTS

SECTION IV **ARRANGEMENTS**

Class A. **DISH GARDENS** (Planted) Accessories permitted

Div. 1. CACTI
2. OTHER SUCCULENTS
3. CACTI & OTHER SUCCULENTS

Class B. **CENTERPIECES** — Accessories permitted

Div. 1. CACTI
2. OTHER SUCCULENTS
3. CACTI & OTHER SUCCULENTS
4. NATURAL, DRIED DESERT MATERIAL*
5. MEXICAN INFLUENCE
6. AMERICAN INDIAN INFLUENCE
7. ANY OTHER CENTERPIECE

Class C. **ARRANGEMENTS ON/or AGAINST THE WALL** — Accessories permitted

Div. 1. CACTI
2. OTHER SUCCULENTS
3. CACTI & OTHER SUCCULENTS
4. NATURAL, DRIED DESERT MATERIAL*
5. MEXICAN INFLUENCE
6. AMERICAN INDIAN INFLUENCE
7. ANY OTHER ARRANGEMENT

Class D. **CORSAGES**

Div. 1. SUCCULENTS
2. DRIED DESERT MATERIALS

Class E. **BUTTON GARDENS**

Class F. **MINIATURE ARRANGEMENTS** — UNDER 5" HIGH

Class G. **SMALL ARRANGEMENTS** — 5" TO 8" HIGH

Class H. **STRAWBERRY JARS** — Cacti and/or other succulents

*No artificial coloring permitted.

Class J. **PATIO PLANTERS** — Cacti and/or Desert Plants

SECTION V. **ARTS — DESERT SUBJECTS**

Class A. **BLACK & WHITE PHOTOGRAPHS**

Class B. **COLORED PHOTOGRAPHS**

Class C. **OIL PAINTINGS**

Class D. **WATER COLOR PAINTINGS**

Class E. **ANY OTHER MEDIUM**

Class F. **DESERT WOODS**

SECTION VI **EDUCATIONAL EXHIBITS**

SECTION VII **OPEN: NON-COMPETITIVE**

The Seventeenth Annual Cactus Show will be held in the Webster Auditorium, Desert Botanical Garden, Feb. 17th-March 1st and is open to all persons interested in Succulent Plants, Arrangements, Photography (B.&W. or colored), Paintings (desert plants or landscapes) or Desert Woods. No entry fee is charged.

All entries must be received not later than 5 p.m. Saturday, Feb. 22nd.

Judging will be held 7-9 P.M. Feb. 22nd.

Awards will be given for the most points accumulated in the four large sections, small trophies will be given for outstanding exhibits in the various classes; ribbons for 1st, 2nd, 3rd and honorable mention, if merited.

Exhibits can be removed only after 5 P.M. March 1st.

Scale of points is as follows:

CACTI & SUCCULENT SPECIMEN PLANTS	
Condition	45
Nomenclature	15
Rarity	10
Size or degree of maturity	10
Staging	20
	100

MINIATURES	
Scale	40
Design	30
Color Harmony	20
Condition	10
	100

ARRANGEMENTS	
Design	25
Color	20
Relationship	15
Originality	15
Distinction	15
Condition	10
	100

CORSAGES	
Technique	15
Design	25
Color	15
Suitable combination of material	15
Distinction	20
Condition	10
	100

The "Handbook for Flower Shows" published by the National Council of State Garden, Clubs Inc., will be used as the basis of exhibiting, point scoring and judging of all Arrangements, Dish Gardens, Miniatures, etc. The Standard System of Judging will be used.

The decision of the National Accredited Judges will be final.

NATIONAL MONUMENTS IN ARIZONA

SAGUARO NATIONAL MONUMENT is located a few miles east of Tucson, Ariz. and comprises about 86 square miles which was established March 1st, 1933. Additional land, having a tremendous stand of large Saguaros, was recently acquired west of Tucson. These areas are for the preservation and the study of the Giant Saguaro Cactus (Carnegiea gigantea). The excellent motor trails are wonderful for the study of desert flora and fauna.

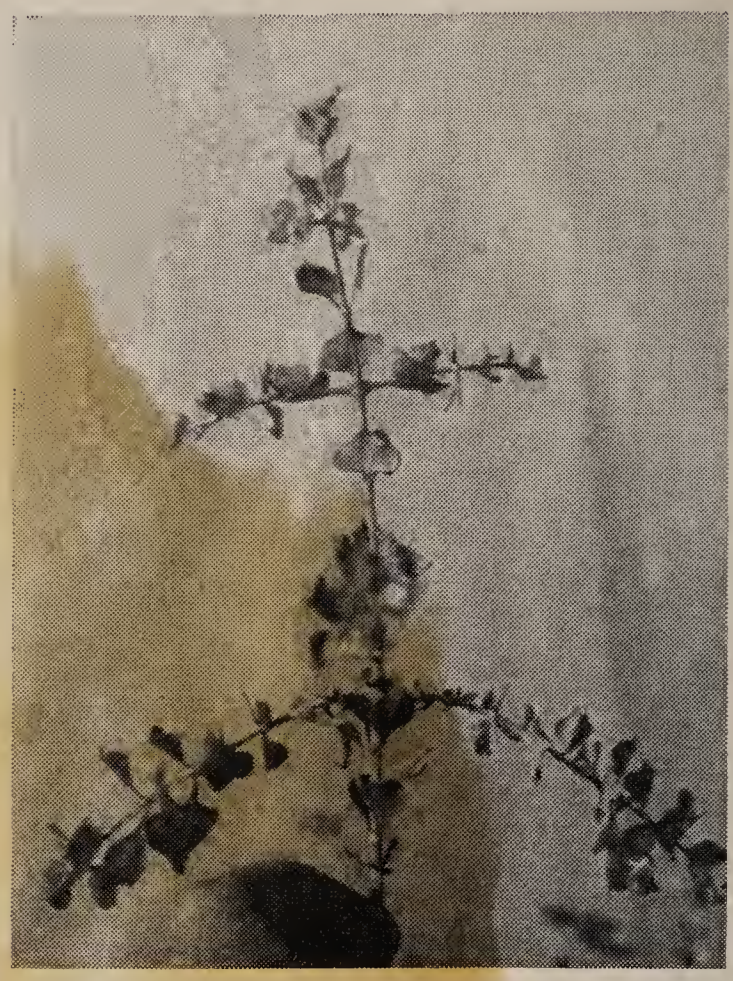
RANDIA ECHINOCARPA

RUBIACEAE family

PAPACHE

DESCRIPTION:

RANDIA ECHINOCARPA is a broad-leaved, drought deciduous shrub or small tree. Lateral branches are arranged at right angles to the main branches with an armament of two or four spines at the terminus of each branch. In heighth, the plant ranges from four to six meters. The oval leaves are sessile and clustered in rosettes. These are rounded at the tip and measure 3.5 to 8.5 cm. in length. Flowering commences in July with white to creamy yellow fragrant flowers being borne in clusters. The flower tube is as much as three cm. in length. Ripening in winter, the fruit is subglobose to round with spikelike protuberances measuring up to three cm. Fruit diameter is about eight cm. and contained within is an edible, black, bittersweet pulp filled with seeds. The seed is thin and flat, seldom measuring more than eight mm. in length and width.



2' branch of *Randia echinocarpa*

DISTRIBUTION:

Papache generally occupies open sunny exposures on foothill sites as well as in the barrancas. It is a common floristic component in the valley bottoms and along arroyo margins. Plants in frequent association with Papache are PITHECOLOBIUM SONORAE, IPOMEA ARBORESCENES, and CASSIA EMARGINATA.

RANDIA ECHINOCARPA is found in the northern states of Sonora and Chihuahua, Mexico and is also reported in the southern states of Guerrero and Vera Cruz. There is a local distribution in south central Sonora ranging north and east from Navajo and Alamos to Los Tanques, San Bernardo, and Mescales.

UTILIZATION:

RANDIA is a multipurpose shrub having particular use as a foundation plant and for specimen or accent planting. It also can be employed as a screening plant, a flowering shrub, or in dividing adjacent areas of the landscape. In addition to fragrant flowers, it is desirable for the unusual fruit that is produced. These make a unique element in dried arrangements.

CULTURE:

To maintain the plant in foliage, it is necessary to apply water bimonthly during warm dry periods. Papache is not particular to soil type, but most frequently occupies a coarse well-drained one. No cold protection is required down to 17°F. and it is possible that it might withstand much lower temperatures. Under optimum growth conditions, adequate space should be allotted for the plant to attain normal form.

Peculiar 3" protuberance-bearing hardened fruit.

PROPAGATION:

Pretreatment of the seed is not necessary. Germination percentage has proven to be lower than expected with fresh seed, however, with controlled temperature and humidity, a higher success rate might be attained. Germination period and growth rate appear to be slow, with a plant only 60 cm. high being the result of three seasons' growth. Seedlings should be started in containers and be transplanted when large enough to establish. Protection from rodents should be provided.

Seeds embedded in 1¼" ball of pulp found within above hard fruit.

REMARKS:

The bittersweet pulp of the fruit will attract those birds with long beaks such as thrashers, woodpeckers, cactus wrens, etc. This unusual species is deserving of a role in desert landscaping.

¼" flatted seeds of *Randia echinocarpa.*

REFERENCES:

Gentry, H. S.—Rio Mayo Plants.

Pesman, Walter—Meet Flora Mexicana.

Standley, P. C.—Trees and Shrubs of Mexico.

SUNSET MAGAZINE, Jan., 1964 had a good story about Phoenix. Pictures and a story of the Garden are on pages 50 & 51.

NEOEVANSIA DIGUETTII — CACTUS family

DAHLIA-ROOTED CEREUS

A plant that would be overlooked as being in the cactus family. Plant is found growing under shrubs and trees with its thin, vine-like stems resting amongst branches of other plants. Stems are reedlike, thin, ¼" thick, usually with 9 indistinct ribs, gray-green, coming from a single, short trunk, ½" to ¾" thick and arising from a group of underground dahlia-like roots or tubers; spines on stems are about 10, 1/16" to 1/8" long, acicular, weak, appressed to the stem, brownish; flowers white to pink, nocturnal, 1¼" long, 1½" across; fruit purple, the areoles having slender spines and long wool; seeds, black, pitted.

This unusual plant is found in the Papago Indian Reservation growing in silt of alluvial bottoms and hillsides near the Mexican boundary. Collecting the plant is prohibited and as a word of warning: do not attempt to collect plants on Indian lands, they, like yourself, do not wish to have persons prowling around their property and disturbing plants. A permit to collect may be obtained from the Indian Council in the area you wish to collect.

TYPE LOCALITY — South of Sells, Ariz.

DISTRIBUTION — Organ Pipe Cactus National Monument to east side of Papago Indian Reservation south to northern Sonora, Mex.

6' tall plant of *Neoevansia diguettii.* Note the slender arching stems.

4" long dahlia-like tubers of *Neoevansia diguettii.*

AMSINCKIA INTERMEDIA — BORAGE family

FIDDLE-NECK

Is one of the earliest of the spring annuals to appear with their bristly and hairy stems in an abundance that covers vast areas with their small, funnel-form, yellow to orange blossoms.

The erect, yet cured scorpion-shaped flower spike, is a distinct character of the plant that also resembles the neck of a violin, thus acquiring the common name of 'fiddleneck'.

It is found throughout southern Arizona growing in gravelly soils in association with Creosote-bush (**Larrea tridentata**). It is a good green forage crop for browsing animals but becomes quite coarse and bristly for animals as the higher temperatures begin to dry out the 6"-10" tall plants.

The genus AMSINKIA was created to honor Wm. Amsinck, a patron of the Hamburg Botanical Garden, Germany, about 1836.

Amsinckia intermedia
Drawing by Art Douglas

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New membership card now indicates the number of years that you have aided the Garden in its growth

BOOK REVIEW

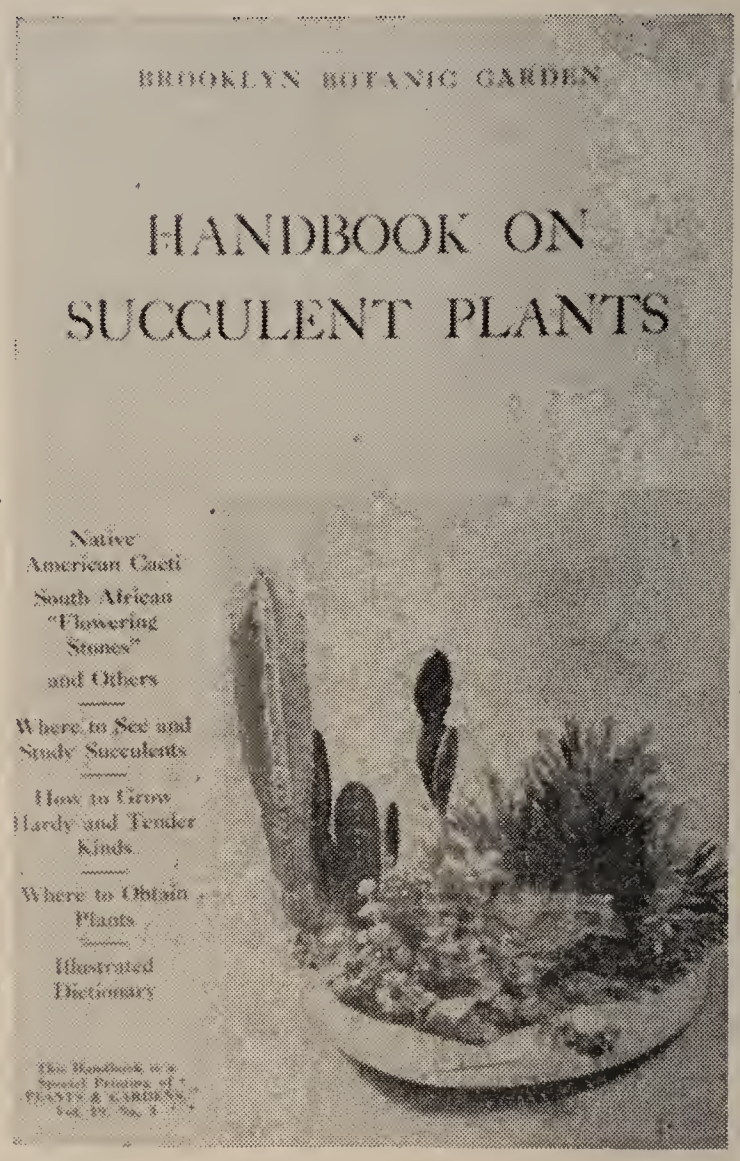
HANDBOOK ON SUCCULENT PLANTS

HANDBOOK ON SUCCULENT PLANTS

What is a succulent plant? Where do they grow? How can I grow them? Where can I buy them? These and many other questions are covered in this 70 page booklet, the 43rd of a series published by the Brooklyn Botanical Garden and now available at the Desert Bontanical Garden for $1.25 postpaid.

Leading succulent plant authorities have contributed twenty-two informative articles that are accompanied by 110 halftones, line-drawings and 20 excellent color plates to make this a good reference booklet which supplants SUCCULENT PLANTS of the NEW and OLD WORLD—E. J. Alexander which had three editions.

Of interest to collectors is included a directory of societies and a catalogue of succulent plant books. The Brooklyn Botanical Garden is to be commended on this excellent and timely handbook.



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ACTIVITIES FOR FEBRUARY

2nd 3 & 4 P.M.—Lecture—Arizona Cacti

4th 8 P.M.—Cactomaniacs

5th 3 P.M.—Class—Culture of Desert Plants in Mexico

9th 3 & 4 P.M.—Lecture—Arizona Wildflowers

12th 9 A.M.—Class—All day desert field trip

13th 3 P.M.—Lecture—Arizona Birds and Animals

16th 9 A.M.—Cactomaniacs field trip
3 & 4 P.M.—Lecture—Arizona Birds & Animals

23rd-March 1st—17th Annual Cactus Show

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVIII March, 1964 No. 3

Natural Dried Centerpiece
Mrs. Monnie Speck

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona. P. O. Box 5415, Phoenix 10. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor

Volume XVIII | March, 1964 | No. 3

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GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

REPORT OF THE 17th ANNUAL CACTUS SHOW

The 17th Annual Cactus Show was the most interesting show to date. It had a personality different from other shows and clearly indicated that our shows are yearly gaining a character and magnitude. Comments were extremely favorable and many visitors returned again with friends to see the fine displays, plants and arrangements.

A new classification, PATIO PLANTERS, attracted thirteen entries. Many were quite large and they occupied a large part of the garden's patio. DESERT WOODS was quite a large classification and certainly enhanced the show. A large number of excellent paintings added a visual touch of the desert. The exhibit cases in the Visitor's Building were again filled with competitive Black and White photos and were held over for an additional two weeks.

Three excellent non-competitive exhibits by Berly Boyton, Herb Bool and Ed Matteson added color and showed imagination. Of great interest was the educational exhibit of HOYAS, hard to raise in the desert succulent milkweeds, by Mrs. Maribel Pratt and John Hales; the large exhibit of cactus plants showing their different spines and their purpose by young Lyle McGill; and an exhibit of seedling and young saguaros by Mrs. Peg Gill.

A portion of the leaf-succulent display

Attendance of 11,244 visitors was slightly under last year's attendance but financial income ($4,526) was the best to date. Mrs. L. Belford, Mrs. L. Turner, Mrs. R. Cooper, Rod McGill and Ed Stocks contributed some of their extra Aloes, Agaves, Prickly-pears, Fig-marigolds and other plants that netted the Garden over a hundred dollars. Many thanks to these members.

Eighty-eight exhibitors, the largest on record, entered 559 exhibits, an increase of one-third over last year's show. This was most gratifying to the Show Committee of John Hales, Rod McGill, Mrs. A. Holt, Mrs. L. Turner and Owen Stradling who had started work on this show just after the close of last year's show.

Judges Paul Shaw of Arizona-Sonora Desert Museum judged Cacti and other Succulents; Mrs. Betty Schimek, Mrs. G. G. Williams, Mrs. A. F. Brown, all Na-

tional Garden Club accredited judges, did a fine job on Dish Gardens and Arrangements; Salvatore Macri was quite busy on determining the winners in Art, Desert Woods and Photographs. These judges are certainly to be commended for their work Saturday night which was most acceptable to the exhibitors.

Full-page spreads and daily photos by our co-sponsor, The PHOENIX GAZETTE, certainly encouraged our winter visitors to view the show and the garden. Radio, TV, and other papers plus announcements in Life, Sunset and Desert magazines gave good coverage for the show. We greatly apprecitted their interest in the garden's show.

We are certainly most grateful for the many VOLUNTEERS who helped to make the show a smooth operating success. They helped at the sales counter, tabulated visitors, sold Nature Walk pamphlets, acted as hosts and hostesses, guards, parking lot attendants, clerks and typists, and gave out needed information to our visitors.

Again, Mr. and Mrs. Hiram Pratt helped every day of the show. Other Cactomaniacs and members of the garden who volunteered their time were: Bernard Davis, Mrs. Frank Feffer, John Garceau, Dr. and Mrs. Lake Gill, Mrs. Thomas Gribble, Mrs. Faith Haft, John Hales, Mrs. Arthur Holt, Mr. and Mrs. Bert Jinneman, Mr. and Mrs. Rod McGill, sons Lyle and Larry and daughter Robin, Mrs. L. V. Matson, Mr. and Mrs. Charles Mieg, Mrs. Laur Nixon, Mr. and Mrs. Hiram Pratt, Mr. and Mrs. Clifford Schroeder, Ed Stocks, J. Owen Stradling, Mrs. R. I. Turner, Mr. and Mrs. Herman Wolf, Don Bauer, Mrs. Z. M. Brady, Mr. and Mrs. W. G. Cook, Mrs. R. Gabel, Mrs. G. W. Gamble, Miss Minnie Gentry, Mr. and Mrs. Harry Hinneberger, Mr. and Mrs. John Henny, Mrs. Denver Henson, Mr. and Mrs. Bernie Lewin, Mr. and Mrs. Dugan Lewis (who have not missed the last ten shows), Mr. and Mrs. MacDougall, Mr. and Mrs. Salvatore Macri, Mrs. Una Miller, Mr. and Mrs. Paul Newman, Mr. and Mrs. James Osgood, Mrs. R. H. Rheinlander, Mrs. May Rossell, Mrs. W. L. Schilling, Mr. and Mrs. D. Squires and son Dave, Miss Marie Steiger, Mrs. Neil Van Ness, C. Willetts, Mr. and Mrs. Miles Zoller, Mrs. Lillian Diven and Mrs. Grace Connolly. Our small staff of eight members greatly appreciated all the help that the above members gave to lighten the load and increase the friendly contacts.

A collection of five succulent genera
J. Owen Stradling

An outstanding educational exhibit of HOYAS
Mrs. Maribel Pratt and John B. Hales

SWEEPSTAKE WINNERS

CACTI—Rod McGill, R. 1, Box 844, Glendale.
SUCCULENTS—J. Owen Stradling, 126 Drew, Mesa.
ARRANGEMENTS—Mrs. R. I. Turner, 324 S. Siesta Way, Phoenix.
ART—Wm. A. Manderfield, 8334 E. Devonshire, Scottsdale.

TROPHY WINNERS

1. BEST CACTI—Mrs. Lillian A. Lugibihl, Tempe, Arizona
2. BEST SUCCULENT—Mr. John B. Hales, Phoenix
3. DISH GARDEN—Mrs. Nancy McMahon, Scottsdale
4. BEST CENTERPIECE—Mrs. Monnie Speck, Phoenix
5. CACTI ARRANGEMENT AGAINST WALL—Mrs. R. I. Turner, Phoenix
6. DESERT ARRANGEMENT AGAINST WALL—Mrs. Joseph Nuber, Phoenix
7. PATIO PLANTER—Mr. Brooks Darlington, Scottsdale
8. COLLECTION OF 5 PLANTS—Mr. J. Owen Stradling, Mesa
9. BEST DESERT SHRUB OR TREE—Mrs. Arthur Holt, Phoenix
10. BEST BLACK AND WHITE PHOTO—Miss Agnes M. Holst, Phoenix
11. BEST DESERT WOOD—Mr. Oswald W. Bridge, Phoenix
12. BEST EDUCATIONAL EXHIBIT—Mr. J. B. Hales & Mrs. Hiram Pratt, Phoenix
13. BEST PAINTING—Mrs. Warren Rice, Tempe
14. BEST MINIATURE ARRANGEMENT—Mrs. Franklin Girard, Apache Junction

RIBBON AWARDS

CACTI-POTTED PLANTS

Opuntia: 1st and 3rd, J. Owen Stradling, 126 S. Drew, Mesa, Arizona; 2nd, Rodrick McGill, Box 844, Glendale, Arizona; 4th, Clifford M. Schroeder, 2126 Ventura Drive, Tempe, Arizona.

Cereus: 1st, Brooks Darlington, 6248 E. Palo Verde, Scottsdale; 2nd, J. Owen Stradling, Mesa; 3rd, Mrs. Roy C. Cooper, 1345 E. Oregon Ave., Phoenix, Arizona; 4th, Laura H. Hixon, 1541 E. Willetta, Phoenix, Arizona.

Echinocereus: 1st, 2nd and 4th, Rodrick McGill, Glendale; 3rd, J. Owen Stradling, Mesa.

Rebutia: 1st and 2nd, J. Owen Stradling, Mesa.

Lobivia: 1st and 3rd, J. Owen Stradling, Mesa; 2nd, Laura H. Nixon, Phoenix.

Echinopsis: 1st, Lillian A. Lugibihl, 811 W. Howe St., Tempe, Arizona; 2nd and 3rd, Bert Jinneman, 601 N. Hayden Rd., Scottsdale, Arizona; 4th, Laura H. Nixon, Phoenix.

Ariocarpus: 1st, 2nd, 3rd and 4th, Rodrick McGill, Glendale.

Stenocactus: 1st, 2nd, 3rd, and 4th, Rodrick McGill, Glendale.

Ferocactus: 1st, 2nd, 3rd and 4th, Rodrick McGill, Glendale.

Echinocactus: 1st, 2nd and 3rd, Rodrick McGill, Glendale; 4th, Brooks Darlington, Scottsdale.

Gymnocalycium: 1st, 2nd and 4th, Rodrick McGill, Glendale; 3rd, J. B. Hales, 1641 E. Willetta, Phoenix, Arizona.

Astrophytum: 1st, 2nd and 3rd, Rodrick McGill, Glendale; 4th, Faith M. Haft, 5717 W. Clarendon, Phoenix, Arizona.

Thelocactus: 1st, Rodrick McGill, Glendale; 2nd, Bert Jinneman, Scottsdale.

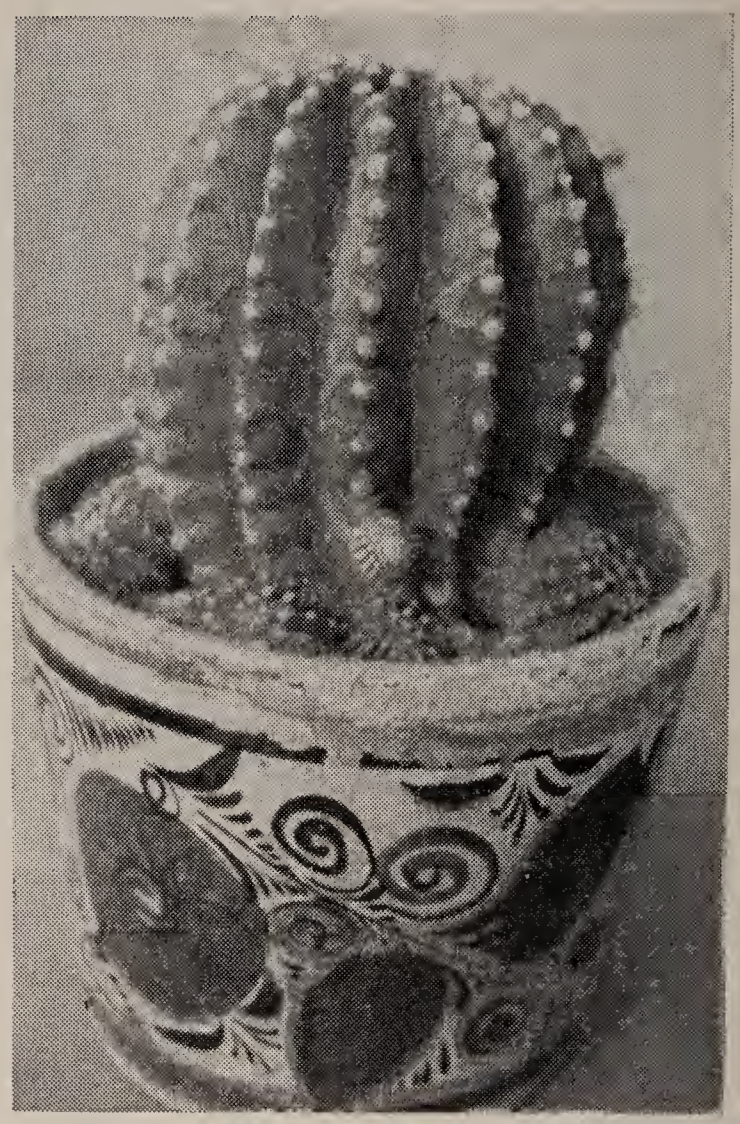
Echinomastus: 1st, 2nd and 3rd, Rodrick McGill, Glendale.

Coryphantha: 1st, 2nd and 3rd, Rodrick McGill, Glendale.

Mammillaria: 1st, Brooks Darlington, Scottsdale; 2nd, Lillian A. Lugibihl, Tempe; 3rd, Rodrick McGill, Glendale; 4th, (tie) J. Owen Stradling, Mesa, and Earl Pierson, 325 W. Willetta, Phoenix, Arizona.

Seedlings: 1st, 3rd and 4th, John Garceau, 4138 E. Granada Rd., Phoenix, Arizona; 2nd, Helen Friedricks, P. O. Box 1683, Apache Junction, Arizona.

Any Other Species: 1st, Bernard Roer, 6553 N. 27th Ave., Phoenix, Arizona; 2nd, Mrs. Hiram Pratt, 5416 E. Avalon Drive, Phoenix, Arizona; 3rd, J. B. Hales, Phoenix; 4th, Rodrick McGill, Glendale.



Best Cactus
Mrs. L. Lugibihl

Neolloydii: 1st, 2nd and 3rd, Rodrick McGill, Glendale.

Notocactus: 1st and 4th, Rodrick McGill, Glendale; 2nd and 3rd, J. Owen Stradling, Mesa.

Epithelantha: 1st, Carl Simmons, 2645½ E. Belleview, Phoenix, Arizona; 2nd and 3rd, Rodrick McGill, Glendale.

Ancistrocactus: 1st, 2nd and 3rd, Rodrick McGill, Glendale.

Leuchtenbergia: 1st, 2nd and 4th, Rodrick McGill, Glendale; 3rd, Bernard Roer, Phoenix.

Dolichothele: 1st, 2nd, 3rd and 4th, Rodrick McGill, Glendale.

Pelecyphora: 1st, 2nd and 3rd, Rodrick McGill, Glendale.

Lophophora: 1st, 2nd and 3rd, Rodrick McGill,, Glendale.

Pediocactus: 1st, Carl Simmons, Phoenix; 2nd, 3rd and 4th, Norman Fickeisen, 9444 N. 3rd Drive, Phoenix, Arizona.

NATIONAL MONUMENTS IN ARIZONA

TUMACACORI MISSION NATIONAL MONUMENT is located 48 miles south of Tucson or 17 miles north of the Mexican border. It was founded by the exploring Jesuit priest Father Francisco Kino in 1691. It is interesting to note that Spain had pushed back the southwestern frontier long before the United States was established. Construction of the Spanish type church began about 1780 and was dedicated in 1822.

An exhibit of the smaller Mammillarias.

Crested Cacti—Own Root: 1st and 4th, Rodrick McGill, Glendale; 2nd, Claire M. Proctor, 1330 E. Coronado, Phoenix, Arizona; 3rd, J. B. Hales, Phoenix.

Monstrose Plants: 1st, J. B. Hales, Phoenix; 2nd and 3rd, Rodrick McGill, Glendale.

Grafted Plants: 1st, Artemas S. Little, 4138 N. 43rd St., Phoenix, Arizona; 2nd, Rodrick McGill, Glendale.

Collections—5 Species of a Genus: 1st, J. Owen Stradling, Mesa; 2nd, Ed. Stocks, 812 Lemon St., Tempe, Arizona.

SUCCULENTS OTHER THAN CACTI—

POTTED PLANTS

Aeonium: 1st, 2nd and 3rd, J. Owen Stradling, Mesa.

Agave: 1st, J. B. Hales, Phoenix; 2nd, Mrs. L. V. Matson, 2218 N. 74th Pl., Scottsdale, Arizona; 3rd, Brooks Darlington, Scottsdale; 4th, Nathan Crane, 7010 E. Continental, No. 94, Scottsdale, Arizona.

Aloe: 1st, Mrs. Nancy McMahon, 6618 Jackrabbit Rd., Scottsdale, Arizona; 2nd, Beryl Boynton, 502 Ocotillo Street, Apache Junction, Arizona; 3rd, Rodrick McGill, Glendale; 4th, Clifford M. Schroeder, Tempe.

Bryophyllum: 2nd and 3rd, Ed Stocks, Tempe.

Crassula: 1st, 2nd, 3rd and 4th, J. Owen Stradling, Mesa.

Dudleya: 1st and 2nd, Rodrick McGill, Glendale; 3rd, Clifford M. Schroeder, Tempe; 4th, Nola Belford, 9928 S. Third Ave., Phoenix, Arizona.

Echeveria: 1st and 4th, Rodrick McGill, Glendale; 2nd, Mrs. Arthur Holt, 4648 E. Palm Lane, Phoenix, Arizona; 3rd, Bert Jinneman, Scottsdale.

Euphorbia: 1st and 4th, J. Owen Stradling, Mesa; 2nd, J. B. Hales, Phoenix; 3rd, Bert Jinneman, Scottsdale.

Gasteria: 1st, Rodrick McGill, Glendale; 2nd and 4th, J. B. Hales, Phoenix; 3rd, J. Owen Stradling, Mesa.

Haworthia: 1st. J. B. Hales, Phoenix; 2nd, 3rd and 4th, J. Owen Stradling, Mesa.

Kalanchoe: 1st, Ed. Stocks, Tempe; 2nd, Mrs. R. I. Turner, 324 W. Siesta Way, Phoenix, Arizona; 3rd, Lillian W. Mieg, 7804 Foothills Drive S., Scottsdale, Arizona; 4th, J. Owen Stradling, Mesa.

Lithops: 1st, Rodrick McGill, Glendale; 2nd, J. B. Hales, Phoenix.

Pleiospilos: 2nd, Mrs. Hiram Pratt, Phoenix; 3rd, J. Owen Stradling, Mesa.

Sedum: 1st and 2nd, J. Owen Stradling, Mesa.

Stapelia: 2nd, J. Owen Stradling, Mesa.

Yucca: 2nd, Clifford M. Schroeder, Tempe.

Any Other Species: 1st and 3rd, J. B. Hales, Phoenix; 2nd and 4th, J. Owen Stradling, Mesa.

Faucaria: 1st, 2nd and 3rd, J. Owen Stradling, Mesa.

Furcraea: 1st, Mrs. Arthur Holt, Phoenix; 2nd, Mrs. L. V. Matson, 2218 N. 74th Place, Scottsdale, Arizona.

Collections—5 Species of a Genus: 1st and 2nd, J. Owen Stradling, Mesa; 3rd and 4th, Mrs. Arthur Holt, Phoenix.

Succulent Crested Plant: 2nd, Mrs. E. L. Kellner, 410 South Hill St., Globe, Arizona.

DESERT TREES AND SHRUBS

Trees: 1st and 2nd, Rodrick McGill, Glendale; 3rd and 4th, J. B. Hales, Phoenix, Arizona.

Shrubs: 1st, Clifford Schroeder, Tempe; 2nd, Mrs. William Burlingame, 3901 N. 83rd St., Scottsdale, Arizona.

Desert Bonsai: 1st, Mrs. Arthur Holt, Phoenix; 2nd, Mrs. Frank M. Feffer, 7349 Clearwater Parkway, Phoenix.

Any Other Desert Plants: 2nd, Mrs. E. L. Kellner, Globe, Arizona.

Terrarium: 1st, Charles Garland, 4450 N. 28th Ave., Phoenix; 2nd, Mrs. Floyd Brown, 8519 E. Rovey Ave., Scottsdale.

ARRANGEMENTS

Dish Gardens (Planted) Accessories permitted): 1st, Mr. Bernard Davis, 550 W. 17th St., Tempe; 2nd, Clifford Schroeder, 2126 Ventura Dr., Tempe; 3rd, Dan Henneberger, 347 E. Orange Dr., Phoenix; 4th, Mrs. William Burlingame, Scottsdale.

Other Succulents: 1st and 2nd, Mrs. Arthur Holt, Phoenix; 3rd, Harry Henneberger, 347 E. Orange Dr., Phoenix; 4th, Earl Pierson, 325 W. Willetta St., Phoenix.

Succulent Centerpiece
Mrs. A. Holt

Cacti and Other Succulents: 1st, Mrs. Nancy McMahon, 6618 Jackrabbit Rd., Scottsdale; 2nd, Mrs. Frank M. Feffer, Phoenix; 3rd, Mrs. Laura A. Wolf, 3102 E. Roma, Phoenix; 4th, Mrs. Arthur Holt, Phoenix.

CENTERPIECES

Cacti: 1st, Mrs. R. I. Turner, Phoenix; 3rd, Mrs. Laura A. Wolf, Phoenix.

Other Succulents: 1st, Mrs. R. I. Turner, Phoenix.

Cacti and Other Succulents: 2nd, Mrs. R. I. Turner, Phoenix.

Natural, Dried Desert Material: (No artificial coloring permitted)—1st, Mrs. Monnie Speck, 3926 S. 3rd Ave., Phoenix; 2nd, Mrs. M. N. Thomas, 7601 W. Whitton Ave., Phoenix; 2nd (Jr. age 6) Joseph N. Peterson, 6840 Avenida El

Alba, Scottsdale; 3rd, Mrs. Norman Fickeisen, 9444 N. 3rd Dr., Phoenix.

Mexican Influence: 3rd, Earl Pierson, Phoenix.

American Indian Influence: 1st, Clifford M. Schroeder, Tempe; 3rd, Mrs. Monnie Speck, Phoenix.

Any Other Centerpiece: 3rd, Mrs. R. I. Turner, Phoenix; 4th, Earl Pierson, Phoenix.

ARRANGEMENTS ON/OR AGAINST THE WALL:

Cacti: 1st, Mrs. R. I. Turner, Phoenix.

Other Succulents: 1st, Mrs. Marta Carpenter, 1802 N. Laurel, Phoenix; 2nd, Mrs. Nancy McMahon, Scottsdale; 3rd, Mrs. Marta Carpenter, Phoenix; 4th, Mrs. Frank M. Feffer, Phoenix.

Mexican Influence: 1st, Mrs. R. I. Turner, Phoenix; 3rd, Mrs. Laura H. Nixon, Phoenix; 4th, Ann Flood, 1502 E. Windsor Ave., Phoenix.

American Indian Influence: 1st, Mrs. Joseph Nuber, 1908 N. 22nd Pl., Phoenix; 4th, Mr. Charles Garland, Phoenix.

Any Other Arrangement: 1st, Mrs. Joseph Nuber, Phoenix; 2nd, Mrs. Marta Carpenter, Phoenix; 3rd, Mrs. Nancy McMahon, Scottsdale; 4th, Mrs. J. Paul Jones, 4501 E. Weldon, Phoenix.

BUTTON GARDENS: 1st, Mrs. Franklin Girard, Rt. #2, Box 343E, Apache Junction, Arizona.

MINIATURE ARRANGEMENTS—Under 5" High: 1st and 2nd, Mrs. Franklin Girard, Apache Junction, Arizona; 3rd, Ann Flood, Phoenix; 4th, Clifford Schroeder, Tempe. 1

SMALL ARANGEMENTS—5" to 8" High: 1st and 2nd, Mrs. Franklin Girard, Apache Junction, Arizona; 3rd, Mrs. Arthur Holt, Phoenix; 4th, Mrs. R. I. Turner, Phoenix.

STRAWBERRY JARS—Cacti and/or other: 1st, Mrs. Hiram Pratt, 5416 E. Avalon Dr., Phoenix; 2nd, Mrs. Harry Bolles, 7019 E. Pasadena Ave., Scottsdale, Arizona.

PATIO PLANTERS — Cacti and/or Desert Plants: 1st and 4th, Brooks Darlington, 6248 E. Palo Verde Lane, Scottsdale; 2nd, Mrs. Thelma Muff, 5344 E. Van Buren, Phoenix; 3rd, Mrs. Nancy McMahon, Phoenix.

TERRARIUM: 1st, Charles Garland, Phoenix; 2nd, Mrs. Floyd Brown, 8519 E. Rovey Ave., Scottsdale.

ARTS—DESERT SUBJECTS

Black & White Photographs: Flower— 1st and 2nd, Miss Agnes Holst, 1901 E. Willetta, Phoenix; 3rd, Howard M. Soule, 338 W. Cinnabar Ave., Phoenix; 4th, Edward Toliver, 7701 E. Verde Ln., Scottsdale. **Plant—**1st and 2nd, Howard M. Soule, Phoenix; 3rd, Edward Toliver, Scottsdale. **Landscape—**1st, 2nd, 3rd and 4th, Howard Pribbenow.

Colored Photographs: 1st and 2nd, Edward Toliver, Scottsdale; 3rd, Frieda Lannoye, 2322 Woodrow Way, Green Bay, Wisconsin.

Oil Paintings: 1st, Mrs. Warren Rice, 519 Broadmoor Dr., Tempe; 2nd, Rena Norviel, 2821 N. 35th Pl., Phoenix; 3rd, E. T. Hansen, Hansens Art Gallery; 4th, Omer H. Lewis, Box 927, Kingman, Ariz.

Water Color Paintings: 1st, 2nd and 3rd, William A. Manderfield, 8334 E. Devonshire, Scottsdale.

Any Other Medium: 1st, Rena Norviel, Phoenix; 2nd and 4th, Cheri Gribble, 4035 E. San Miguel, Phoenix; 3rd, William A. Manderfield, Scottsdale; 4th (tie) Mrs. Edward Comins, 6721 E. McDowell Rd., Unit B, Bldg. 326, Scottsdale.

Desert Woods: 1st, Mr. Oswald W. Bridge, 9843 N. 29th St., Phoenix; 2nd and 3rd, 'Matt' E. P. Matteson, 1216 E. McCellen, Phoenix; 4th, Dick Serino, 2212 W. Virginia, Phoenix.

EDUCATIONAL EXHIBITS: 1st, Mrs. Hiram Pratt and J. B. Hales, Phoenix; 2nd, Lyle McGill, Glendale; 3rd, Mrs. L. S. Gill, P. O. Box 1682, Apache Junction, Arizona.

JACQUINIA PUNGENS A. Gray Fam. THEOPRASTACEAE

SAN JUANICO

DESCRIPTION:

JACQUINIA PUNGENS is a single or multiple stemmed evergreen shrub or small tree from one to seven meters in height. The symmetrical crown is quite dense and oval in shape. Bark of the larger branches and trunk is gray; that of the shoots is light-green. The leaves are opposite in position and glabrous on the ventral surfaces. These are rigid with an entire margin terminating in a pungent spine. Measuring from three to six centimeters in length, the leaves vary in shape from linear-lanceolate to oblong. Flowers are terminal in short racemes and are orange or reddish in color. A thickened corolla consists of five petals. Flowering occurs in July and August, the flowers being quite fragrant. A hard globose fruit is spine-tipped and measures up to two centimeters in diameter. This persistent fruit contains only a few red-brown seeds imbedded in a white matrix.

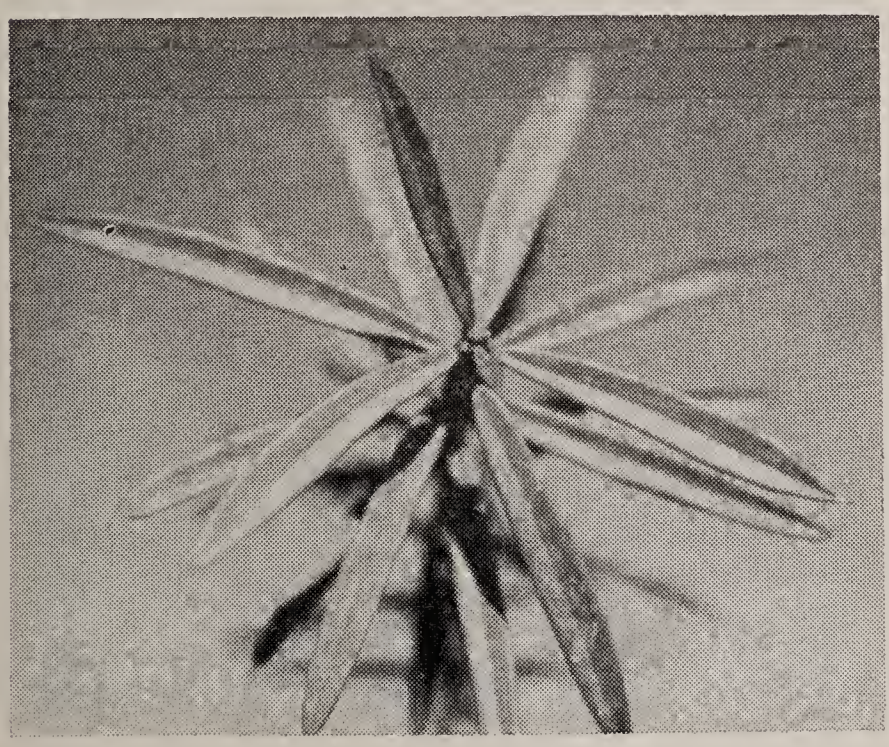
DISTRIBUTION:

SAN JUANICO grows in open exposures within the lowland valleys of the thorn and short tree forests. In elevation this plant ranges from 15 meters up to 650 meters. Plants commonly in association with SAN JUANICO are OLNEYA TESOTA, CERCIDIUM SONORAE, GUAIACUM COULTERI, and FOUQUIERIA McDOUGALLI.

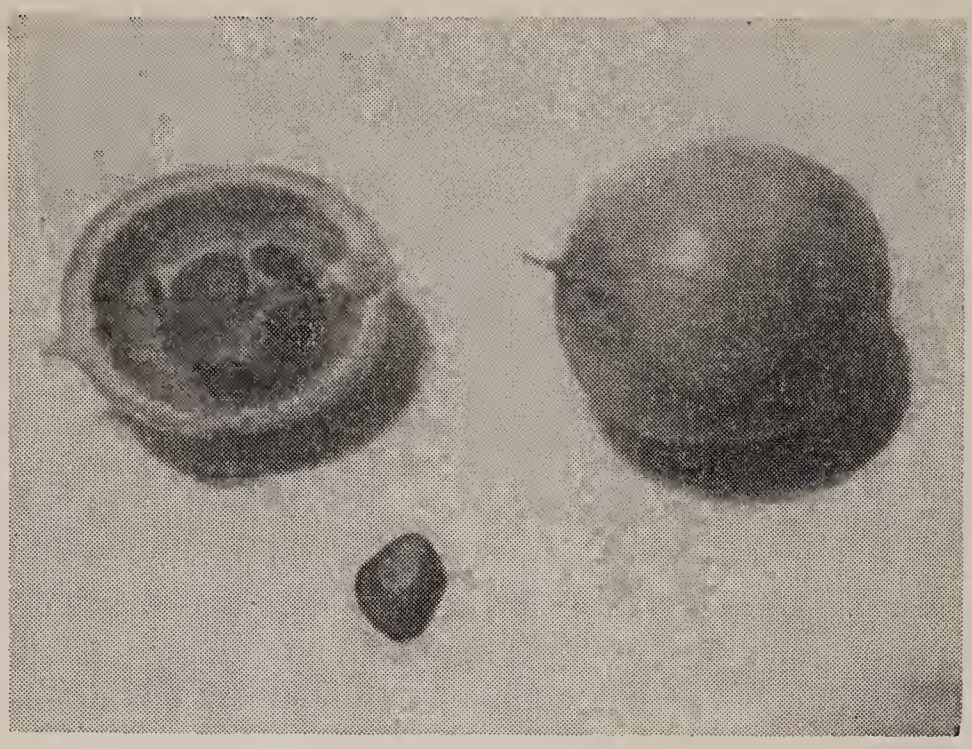
The geographic distribution is a discontinuous one extending from Sonora state to Vera Cruz and Chiapas, Mexico and then south into Guatemala. It is also reported from the Mexican states of Sinaloa and Oaxaca. In Sonora SAN JUANICO is a plant found at stations north of Guaymas and at Cedros, Ures, and San Bernardo.

UTILIZATION:

JAQUINIA used alone or in conjunction with other desert trees would be very effective for screening purposes. In very dry locations this species is desirable as a specimen shrub or tree. The dense crown of deep green color provides a contrast in color and texture with other typical desert plants. As a flowering plant, its usefulness is limited by the spine-tipped leaves which prohibits planting near areas of human contact. On west and south exposures, where subjected to high summer temperatures, JACQUINIA can be employed to break large blank wall areas or fence lines.



Terminal branch of *Jacquinia pungens*. Note the pungent or sharp-tipped leaves. 1X



Spine-tipped fruit split open to show the seed of *Jacquinia pungens.* 1 1/3X

SAN JUANICO will withstand low temperature of 20°F. if it is taken into the winter months in an inactive growing state. At this temperature only minor damage occurs and recovery is rapid. A full sun exposure on well drained soil provides optimum growth. Weekly irrigation should be provided during the dry months of summer for the first two years after planting.

PROPAGATION:

Germination rate and growth of JACQUINIA is slow. From 45 to 90 days are needed for seed germination, but no pretreatment is necessary. Most fruits are insect infested, but seed loss can be reduced by fumigating the fruit soon after collection. Protection from rodent damage should be provided until the main stems are several centimeters in diameter. Young seedlings need to be under cover during the colder months of winter.

REMARKS:

JACQUINIA PUNGENS has proven to be hardy in south central Arizona, being one more species of Sonoran origin that is adaptable for desert landscaping.

REFERENCES:

Gentry, H. S.—Rio Mayo Plants.

Shreve, F. S.—Vegetation of the Sonoran Desert.

Standley, P. C.—Trees and Shrubs of Mexico.

ACTIVITIES FOR MARCH

3rd	8 P.M.	Cactomaniac's meeting
4th	3 P.M.	Class—Deserts and their Plants
5th	3 P.M.	Lecture—Arizona Wildflowers
8th	3 & 4 P.M.	Lecture—Arizona Cacti
11th	3 P.M.	Class—Succulent Plants
12th	3 P.M.	Lecture—Arizona Trees and Shrubs
15th	8 A.M.	Cactomaniacs field trip
	3 & 4 P.M.	Lecture—Arizona Wildflowers
18th	3 P.M.	Class—Culture of Succulent Plants
19th	3 P.M.	Lecture—Arizona Birds and Animals
22nd	3 & 4 P.M.	Lecture—Arizona Birds and Animals
25th	3 P.M.	Class—Arizona Trees and Shrubs
26th	3 P.M.	Lecture—Arizona Scenics
29th	3 & 4 P.M.	Lecture—Collecting Plants in Mexico

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVIII April, 1964 No. 4

OCOTILLO *(Fouquieria splendens)*

see p. 44—"Confessions of a Cacto-maniac"

REG MANNING

SAGUAROLAND BULLETIN

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W. HUBERT EARLE, Editor

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GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

YUCCA RIGIDA

LILIACEAE Family

Silver-blue Yucca
Palma San—(Zacatecas)
Palmilla (Durango)
Palmita (San Luis Potosi)

Yucca rigida, 4′-6″ tall and 6′ wide, age 5 years.

In the summer of 1958 Andre Cuenoud and your editor made a most successful collecting trip through Mexico with Board Member Charles Mieg. One of the hundreds of plants that aroused our interest was a silver-blue yucca of about 8′ tall in the hills eighty miles north-east of Durango, Mex. We found a few seeds but later Mr. Mieg had Fritz Schwarz of San Louis Potosi send about half a pound of the seed. A story about the germination of these seed by Chas. Mieg can be found on page 19 of the Feb. 1959 issue of Saguaroland Bulletin.

The garden germinated a large number of the seeds and when the seedlings were about a year old and about 8″ tall many were given to members of the garden and other botanical gardens for experimental horticultural observation. So far, the best results were obtained by Clifford Schroeder, 2126 Ventura Drive, Tempe, Ariz., who has developed a most effective desert planting in his front yard.

Mr. Schroeder planted his seedling in decomposed granite in the spring of 1960 and was able to get it to the flowering stage in four years and with a height of 4′-6″. To the best of our knowledge this is the first **Yucca rigida** to bloom in the United States. It had a tall, wide cluster of flowers, as shown in the accompanying photographs, that continued to bloom for five to six weeks with a delightful odor.

This is another of the Garden's introductions that will make a most effective landscaping plant with its eye-catching silver-blue rigid leaves and its spring panicle of white blossoms. When in Tempe, be sure and observe this Yucca. The Schroeders will be most happy to show it to you but they suggest that you leave your digging tools at home.

CACTOMANIACS FIELD TRIPS

A few of the 25 hikers who visited 7-Springs in January

Group with children who visited Joshua Tree Parkway northwest of Wickenburg in February

PITHECOLOBIUM FLEXICAULE (Benth.) Coulter

LEGUMINOSAE Family

"Ebano"

Texas Ebony

DESCRIPTION:

Pithecolobium flexicaule grows into a tree attaining a height of 15 meters. Its growth is limited in some instances to shrub form with spreading irregular branches. Armament consists of straight spines separated by short internodal distances. Terminal growth from a node is divergent resulting in a zig-zag pattern of branch development. The wood is dense and hard with a specific gravity of 1.04. Heartwood is dark red or brown, the sapwood is yellow. Leaves are bipinnate with 2 or 3 pairs of pinnae and 3 to 5 pairs of oblong leaflets. These numerous leaflets are dark green and shiny on the dorsal surface and are persistent except for periods of extended drought. Leaflets measure 5 mm. to 12 mm. in length. The leaf is long petiolate, the petiole being glanduliferous. Flowering occurs in mid-summer with a profusion of creamy-yellow, dense, cylindrical spikes. The spike measures 3.5 cm. in length and bears florets with exerted stamens. The flowers are very fragrant and attract a multitude of flower feeding flies, wasps, and bees. Fruit consists of a hard woody legume pod 15 cm. long and 2.5 cm. wide with a short pointed apex. Color varies from brown to black and the somewhat compressed valves are dehiscent. Seed is red-brown in color, obovate in shape, and contained within a pitchy pulp.

DISTRIBUTION:

"Texas-ebony" extends into the United States on the Rio Grande plains in southwestern Texas. In Mexico it is found on the intermontane plains in the state of Tamaulipas and Nuevo Leon.

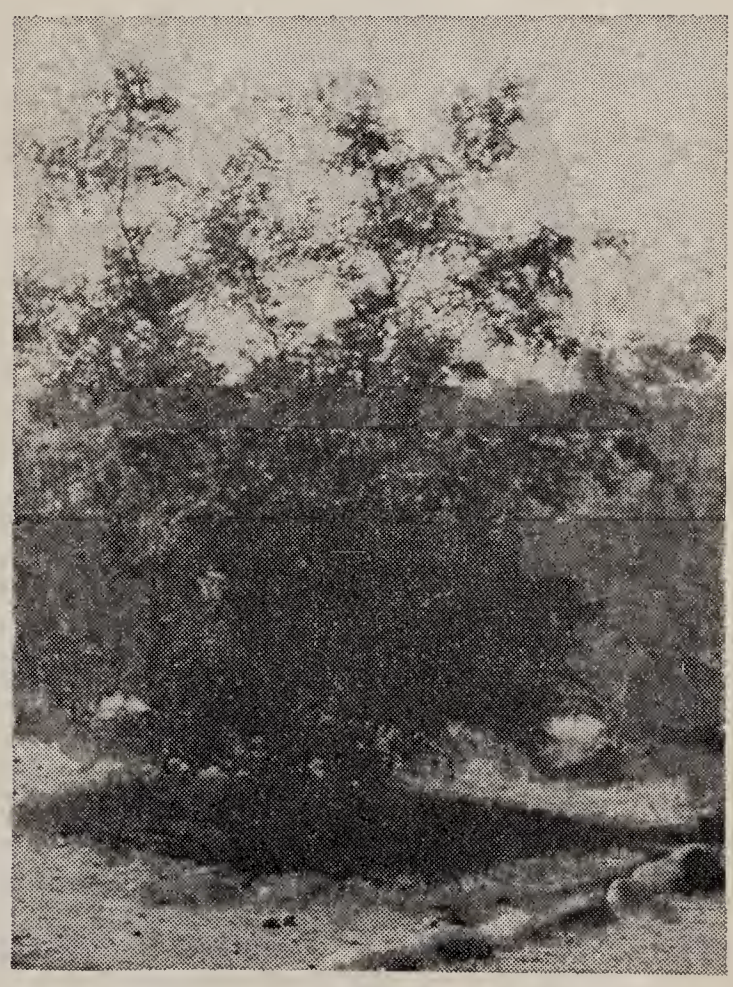
Growing primarily on valley soils, this species is in association with YUCCA AUSTRALIS, CERCIDIUM FLORIDUM, and ACACIA WRIGHTII.

UTILIZATION:

As a landscape item, Texas ebony is a multiple purpose plant. Being of dense growth, it makes a very effective screening shrub when used alone or in combination with other desert species. A bright green color coupled with a dense crown results in a specimen shrub or tree that is particularly pleasing. When used in the desert garden, PITHECOLOBIUM provides a marked contrast in color and texture to most other desert plants. Flowering is of short duration, but of such profusion as to merit consideration of this plant for such purpose.

CULTURE:

Periodic deep irrigations during dry seasons are required to maintain PITHECOLOBIUM FLEXICAULE in foliage. Mulching with manure will provide a light nitrogen feeding. Spatial require-



Pithecolobium flexicaule tree 9′ tall and 6′ wide

Flowering branch of *Pithecolobium flexicaule*. Note the opposite, sharp spines.

ments are considerable to allow for the widespread crown of spiny branches. This species is capable of withstanding a temperature range of 17°F. to a high of 115°F.

PROPAGATION:

Pretreatment is necessary to break the seed coat impermability and sacrification or soaking in hot water will achieve this result. Germination is rapid, but subsequent growth is at best only moderate. Seedlings are best grown in containers for one or two seasons before planting in the ground. Stored seed retains viability for a long period with no special care.

REMARKS:

"Texas-ebony" as a trade item has been available in southern Arizona nurseries, but it has not been utilized to its fullest potential. A greater application of this species is overdue.

REFERENCES:

Bailey, L. H.—The Standard Cyclopedia of Horticulture.

Cory and Parks—Catalogue of the Flora of Texas.

Goldman, E. A.—Biological Investigations in Mexico.

Standley, P. C.—Trees and Shrubs of Mexico.

Winter Desert Plant Class on Field Trip, eating lunch at Saguaro Lake

NATIONAL MONUMENTS IN ARIZONA

ORGAN PIPE CACTUS NATIONAL MONUMENT was established by President Franklin D. Roosevelt April 13, 1937, to protect and preserve a spectacular portion of the Sonoran desert. Its 328,162 acres makes it the largest Monument in Arizona. It is located adjacent to the Mexican border and its northern boundary is 8 miles south of Ajo, Arizona. This Monument deserves your acquaintance with its Organ-Pipe *(Lemaireocereus thurberi)*, Senita *(Lophocereus schottii)* and other cacti.

CONFESSIONS OF A CACTOMANIAC II

By Brooks Darlington, Scottsdale, Ariz.

Once the cactus-collecting bug sinks its venomous shaft into your bloodstream, you'll never be the same again.

Actions which otherwise would have a rational and innocuous purpose—such as taking a business trip or driving your family to see Aunt Minnie—somehow become perverted to your all-consuming mania.

Hence, it is in the hope of sparing other addicts some of the more painful experiences attendant upon the disease that we continue these "confessions," begun in an earlier issue of the Saguaroland Bulletin.

This chapter concerns a quick trip to and from Ensenada, about 65 miles south of Tijuana along the northwest (Pacific) coast of Baja California, Mexico. Ostensible purpose was an exchange visit between the Rotary clubs of Ensenada and Scottsdale, Arizona.

However, your correspondent caught himself in the first furtive act when he called others in the planned 'car-pool" to report that he'd be delayed in leaving and hence would come down by himself in his own car. (By coincidence, this vehicle is a station wagon capable of hauling a cargo of stickery stuff, or whatnot.)

The second act indicative of this strange addiction was to scorn the fast, smooth, familiar but conventional route, Highway 80 to San Diego and thence southward. Nor did we deign even to enter Mexico at Calexico-Mexico. No, we had to go for the whole bundle, dropping down from Yuma, Arizona to San Luis, B. C., thus staying in Baja the entire width of the peninsula.

Only a confirmed back-road collector would deliberately choose this route. Not that there are any real hazards involved. It's simply that this is not the normal or logical way of getting to your destination. It appeals primarily to those who get a kick out of venturing into new areas.

The road in some places is narrow, twisty or rough. Often it is crowded with the motley hordes of animals, people and quaint conveyances so characteristic of rural Mexico. Direction markers are typically scarce or non-existent. Hence, we got lost in the industrial section of Mexicali in addition to encountering a religious holiday wherein even the goats and burros seemed en route to honor their departed ancestors. That's Mexico!

Nevertheless, to anyone more interested in the path than the goal, the journey across Baja paralleling the U. S. border is a rewarding one.

In addition to the omnipresent reminders of a way of life quite different from ours, the terrain offers remarkable variety. South of Yuma and around San Luis one traverses areas of drifted sand-dunes typical of the low tidewater delta forming the mouth of the once-cavernous Colorado. Adjacent, in the irrigated areas, are lush fields of truck crops and cotton.

Away from the life-giving water, the aspect becomes sere and bleak almost beyond belief. It varies from vast salt flats to a mountain range rising precipitously from around sea level to some 5,000 feet. These mountains seemingly are comprised of barren rock cliffs and huge granite boulders strewn about as if by El Diablo in a fit of temper.

This is the Sierra de Juarez range of the cordillera that forms the rocky "spine" of the Baja peninsula. Yet here, in place of forested slopes and wooded canyons, is a sun-parched terrain reminded of nothing else on earth, or even the moon.

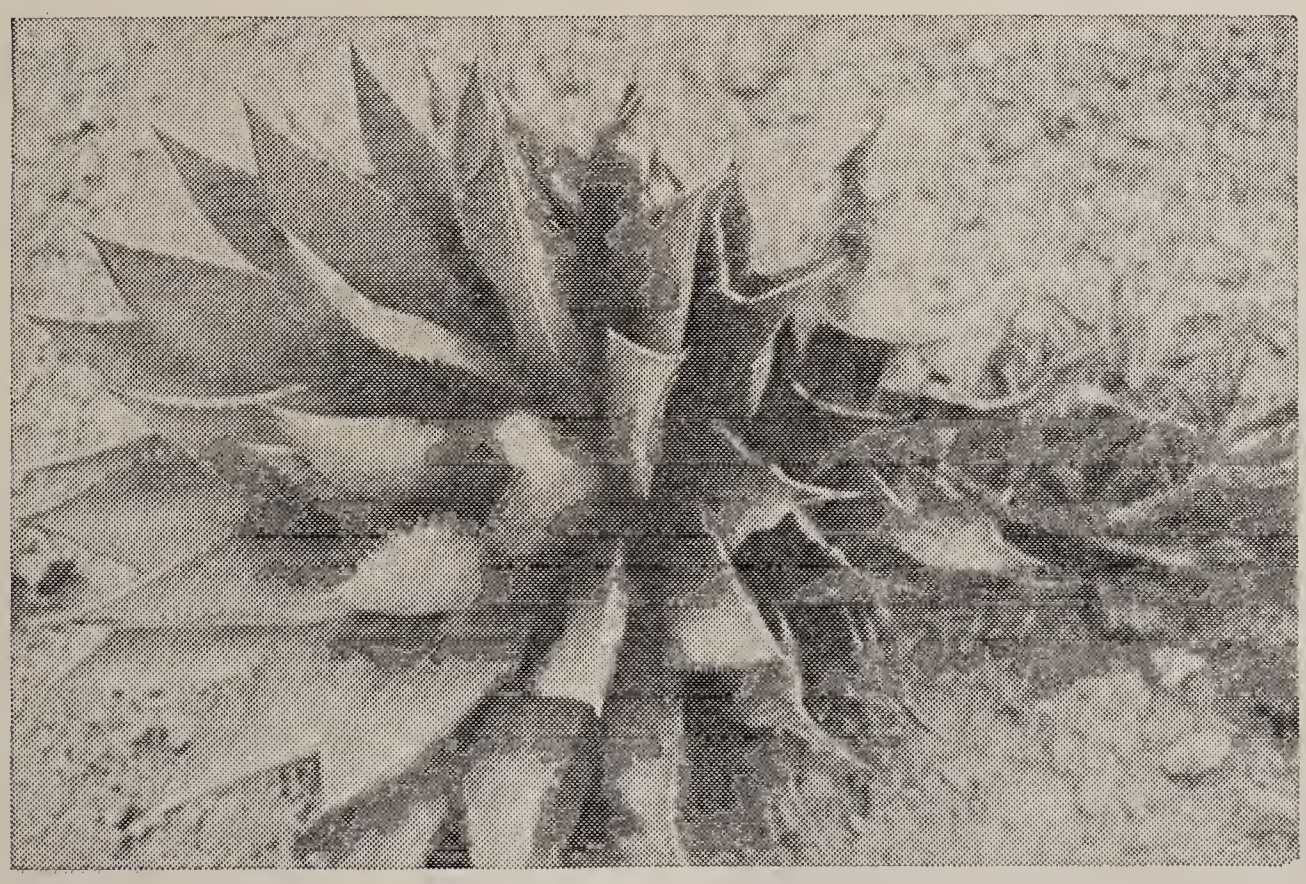
Astonishingly enough, however, the area supports a variety of arid-country flora. Leafless but flame-tipped ocotillos are the most prominent, but a close inspection reveals also a few cacti such as cholla and hedgehogs in species similar to those found on the Mohave desert further north. However, a jackhammer would be needed to wrest the plants from Mother Nature's stony grip. So on to a more favored clime!

In the gathering dusk and the shortage of signs, we missed the cut-off to Ensenada and had to go on to Tijuana. The short way is to turn left at Tecate (after sampling the fine beer made there), thus leaving Highway 2 and taking the direct route to Ensenada designated as Highway 3.

This road has been built up during recent years to transport cotton and other agricultural produce from irrigated areas along the east end of the border to Ensenada. That thriving port city nestles on hills rising from a bay studded with freight ships from all points of the globe, including Russia and its satellite countries.

And even though the sparse moisture that gets to these hills must carry a high saline content, the plant-life they support is enough to light the eyes of a cactophile with avarice. And if to make legal larcency easy, a peninsula called Point Banda, projecting from the coastline to form Ensenada's harbor, provides a common meeting ground for succulent plants otherwise occurring in scattered spots and not necessarily in association with each other. Even more convenient, a good road extends out to the wave-splashed rocky cliffs at the tip, providing access to both sides of the promintory.

Most striking of the plants encountered there is Agave shawii. This species has fleshy leaves of a rich dark green with sharp points tending to red. It is highly regarded by Arizona landscapers and sometimes called "Mexican century plant." This beautifully shaped agave occurs on the peninsula in great swaths like textured green carpets stretching along the mist-bathed hills. It varies from seedling size to huge specimens four men couldn't lift.



Partial procumbent *Agave shawii* 2′-2″ tall showing offsets at its base.

Needless to say, this size range provides plants suitable for "liberation." Nor need one feel pangs of conscience about separating them from their homeland. Just the number decaying along the roadside after being uprooted by bulldozers would populate all the desert-plant gardens of the world—not to mention the thousands upon thousands of plants seen in the process of dying after having blossomed.

In the line of leaf-succulents the visitor likewise can revel in broad expanses of the Buff Orpington of the "hens-and-chicks' family. Echeveria. . . . This plant provides a fascinating visual design of short and long leaves forming a bowl shape often 6 inches or more across, with the outer leaves tinged red.

These in turn frequently grow in clusters, so that a single stem may look like a market-basket full of cabbages. Vast numbers of this plant likewise spread over the rocks and down the hillsides, providing light-green and pink-to-red fringes to the carpet. Here in our Arizona habitat they appear to do well in protected places that have more humus and get more water than native cacti demand.

Bergerocactus emoryi

Interspersed among the patches of agaves and echeverias is a cactus that looks like a low-growing staghorn-type cholla with golden spines. This is identified as Bergerocactus emoryi. Our Desert Botanical Garden has the plant, growing in its lathe house. It suckers like an Echinocereus, seldom gets more than some 24 inches high and is attractive for its bright spine coloration and angular branching habit as well as for its yellow blooms.

Still another interesting member of the cactus tribe found on Point Banta and largely unfamiliar to U. S. desert denizens is a relative small barrel, Ferocactus viridescens. Most of the specimens we brought back for scientific observation under local environmental conditions (that's hep egghead lingo, if not strictly veracity!) run in size from that of a small orange to a large grapefruit. The largest we saw was only about one foot across. It is very symmetrical to the eye, being rather hemispegerical in shape, like a half-grapefruit flat side to the ground. The spines vary from brownish red to light gold, giving a rather jolly glint in the sun.

Point Banta likewise affords Echinocereus and mammilaria in quantities, although the species do not appear to differ much from our native Arizona hedgehogs and pin-cushions.

As for getting these or any similar plants collected in Baja California back to one's home-base, remember first of all that a U. S. Dept. of Agriculture Plant Import Permit is needed.

Then it is necessary to check in at the U. S. Customs at San Ysidro, on the California border opposite Tijuana. If it is deemed that fumigation is required, you are in for some expense as well as delay.

The requirement in the event you wish to take the plants with you instead

Ferocactus viridescens

Ferocactus viridescens var. littoralis

of paying a fee and letting the Customs people handle same in their due (or undue!) time is for you to pay on an hourly rate the salary of a man to conduct you to a quarantine center such as the one at San Diego County Operations Center. This in our case ran to about sixteen dollars and delayed our return to Arizona some 7 or 8 hours, which put us into Scottsdale after midnight of that day.

An arbitrary ruling, formulated without the benefit of law by the Customs Bureau itself, is invoked at ports of entry bordering Arizona that limits plant collectors to specimens measuring no more than 12 inches in any direction. This of course bars legal importation (except by special permit) of anything but seedlings or cuttings of the larger Mexican cacti.

While the following information is not official and we didn't put the idea to a clear-cut test, we understand that at San Ysidro here's a small saving grace in this situation. This point of entry is said to be not too strict in its interpretation of the size regulations. (We had a few specimens such as clumped Echinocereus that exceeded the one-foot limitation, and found the "bug-men" more interested in insects than in inches.)

Anyway, now that you've experienced vicariously some of the pleasures and frustrations of collecting in Baja and getting the booty home alive, maybe you'll know a bit more about what to expect. If the foregoing helps spare you aimless searching for plants or their confiscation by the authorities we'll be happy as a doctor with a cure for the common cold!

ARIZONA HIGHWAYS Magazine, March 1964 issue, had a feature story, "The Changing Face of Phoenix" in which the Garden was several times mentioned. A full-page Ektachrome photo of the Garden by Darwin Van Campen can be seen on page 14. Oor thanks to Arizona Highways Magazine for this publicity.

Another interesting group of Japanese visitors to the Garden—the above women returning to Japan from conferences in Washington, D.C. Phoenix hosts were Paul Matsusaki (left) and Jimmie Komatsu (right). Left to right are Mrs. Toki Kobayoshi, vice president of League of Women Voters; Mrs. Hideo Sekini, Women's Representative of the Dept. of Labor, unidentified, Mrs. Saloko Tanaka, vice president of House Wives Association; Mrs. Nobuko Himeura, Chairman of Political Committee of Women's International League for Peace; Mrs. Earle, and Mrs. Akiko Mitsumaki, representative of National Federation of Women's Organizations.

ACTIVITIES FOR APRIL

1	3 P.M.	Class Identification Desert Trees and Shrubs.
2	3 P.M.	Lecture—Succulent Plants other than Cacti.
5	3 & 4 P.M.	Lecture—Arizona Cacti in Bloom.
7	8 P.M.	Cactomaniacs Meeting.
8	9 A.M.	Class. All-day desert field trip.
9	3 P.M.	Lecture—Arizona Cacti in Bloom.
12	3 & 4 P.M.	Lecture—Arizona Wildflowers.
16	3 P.M.	Lecture—Arizona Wildflowers.
19	3 P.M.	Lecture—Arizona Trees and Shrubs.
23	3 P.M.	Lecture—Arizona Trees and Shrubs.
26	3 & 4 P.M.	Lecture—Arizona Birds and Animals.
30	3 P.M.	Lecture—Arizona Birds and Animals.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVIII May, 1964 No. 5

Coyote-melon *(Cucurbita fetidissima)*. An interesting non-edible cucumber with yellow flowers that are followed by green fruits that turn yellow in the fall and are found along highways in the ditches.

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona. P. O. Box 5415, Phoenix 10. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscripion $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor

Volume XVIII | May, 1964 | No. 5

Arizona Cactus and Native Flora Society

EXECUTIVE BOARD

Chairman of Board ... John H. Eversole
President ... Lou Ella Archer
Vice President ... John H. Rhuart
Treasurer ... Tom Goodnight
Secretary ... Angela Bool
Chief Counsel ... Richard B. Snell

Reg Manning, Edward Burrall, Charles Mieg, Mrs. Mildred May

ADVISORY BOARD

Chairman Les Mahoney

James Cahill, Mrs. Walter Douglas, Mrs. Geraldine Eliot, Mrs. Charles Gilliland, Mrs. Homer Lininger, Miss Eleanor B. Sloan

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Desert Botanical Garden of Arizona

STAFF

Director ... W. Hubert Earle
Horticulturist ... John H. Weber
Maintenance & Bookstore ... Wm. C. Hendrix
Bookstore ... June Hendrix
Interpretation ... Larry Kellner
Student Horticulturist ... Terry Truesdell
Student Horticulturist ... Wm. Halvorson

GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

MEMBERS ANNUAL MEETING

Was held Sunday, May 3rd, at 3 P.M. in the Webster Auditorium with the largest attendance to date for an annual members meeting. This may have been due to the "mailed announcements" to members a few days before the meeting. Announcement is usually in this Bulletin.

John Rhuart, Vice President, presided. Mrs. Angela Bool, secretary, gave the minutes of the last meeting. "Mailed-in" votes were tabulated by Mrs. Clifford Schroeder and Minnie Gentry. Incumbent members Reg Manning and Charles Meig were elected for additional three year terms.

A report of the year's past and future activities plus another successful financial year was given by the Director.

29th ANNUAL BOARD MEETING

Executive and Advisory Board members, their wives and husbands met for another enjoyable annual dinner meeting at the Kiva Club, Westward Ho Hotel, May 13th with Chairman John H. Eversole presiding.

MINUTES of the Annual Members meeting and last Board meeting were read by Secretary Angela Bool, corrected and approved by the members.

ELECTION of incumbent board members and officers was approved by the board members.

FINANCIAL report (page 53) was presented by Treasurer Tom Goodnight and detailed by the Director who then reported on the past year's activities, budget for 1964-65 and projects for the summer and coming year.

INSURANCE. The Garden's General Liability insurance policy of $250/500,000 Personal Liability and $10,000 Property Damage was discussed and the Board voted to increase the limits to $500/1,000,000 Personal Liability and $50,000 Property Damage. The additional cost is relatively low compared to greater coverage to the Garden and its Board Members.

Bids were reviewed but no present action taken on a 10,000 whole-life policy on the Director. The Garden and Mrs. Earle would be equal beneficiaries. The Garden's portion would then 'bridge-over' the income during the period of acquiring a new director. This is quite a good business-like move.

BIDS were checked for the paving of the main paths through the Garden and they varied from .68c to $3.00 per square yard. The Board suggested using the lowest bid if their work is satisfactory. Plans call for 13,239 sq. ft. (1471 sq. yards) to be paved this year and about the same amount in 1965.

The present paths were 'built-up' and maintained by the staff for the past 15 years and were wearing out in many spots. It is about time that we install 'maintenance-free,' neat, clean paths for our visitors through the garden and lath-houses.

ANNOUNCEMENT was made that the Garden would co-host the 11th Biennial Convention of the Cactus & Succulent Society of America May 2nd-5th, 1965, and the Tucson Cactus & Botanical Club would co-host May 6th-8th in Tucson. About 150-200 fanciers are expected to register for this big convention. The Garden was host for the 4th Biennial convention July, 1949, and a memorable time was had by all.

An AUDIT and bookkeeping service by a certified accountant was suggested. A committee of Tom Goodnight, Reg Manning and your director was formed to check the yearly costs of such a service with accountants for an organization such as ours.

DIRECTOR'S REPORT

1963-64 was another busy year for the Garden despite a cool winter and intensive competition of many adjacent activities which dropped our attendance a few hundred under that of last year. Illusrated lectures were extended to two showings each Sunday afternoon and were well attended. Field trips were held each month for the Cactomaniacs. A printed schedule of activities for 1964 was mailed to all members, newspapers, etc., and 'handed-out' to visitors inquiring about the classes, lectures, etc.

The dusty parking lot was paved and lined for easy parking of about 200 cars and is quite an asset to the Garden. Its cleanliness is reflected in the floors of the Visitor's building. An addition was made to the warehouse for storage purposes. The warehouse is now an electrically-wired shop equipped with a saw-planer, drill-press, grinding wheel, air-compressor and outside flood light.

The Garden has for many years needed a truck and a tractor with lift-bucket and grading attachments. These we were able to locate at good prices this spring. Their usefulness will be appreciated in the heavy work we have planned this summer in the construction of new paths, rocked beds,building of the leaf-succulent lath-house and grading of roads.

A truck trip to the coast is planned next month for plants being donated to the garden by Don Skinner of Los Angeles. Another trip is planned for the fall to San Diego for additional plants for the new lath-house.

Financially, 1963-64 was the highest income year experienced by the Garden. Expenses were high but our Inventory is over twice that of any year due to large quantity purchases at low prices that will give the Bookstore a greater profit. For comparison check the financial report on opposite page.

One question raised at the Board meeting was, "What expenses are contained in the General Expense" account of $4,618.20?"

Following is the break-down of the account:

Stamps	$ 333.08
Office supplies	27.69
Library books and memberships	156.45
Photographic supplies and developing	392.30
Advertising (Arizona Guide & Panorama)	197.55
Printing & Saguaroland Bulletin	1,219.52
Janitor supplies	43.56
Cactus Show and Board dinners	282.58
Maintenance supplies	319.00
Painting of signs	177.07
Travel expenses Arizona, Calif., Mexico	321.55
Air-conditioners (4) service	113.62
Lath-house supplies	108.38
Flowers and wreaths	43.85
Cactus Show	310.00
Lease of Garden from City of Phoenix	25.00
Roofing repairs	47.00
Contribution to U. of C. towards the 7th expedition to the Andes	500.00
	$4,618.20

ARIZONA CACTUS AND NATIVE FLORA SOCIETY

Sponsoring the

DESERT BOTANICAL GARDEN
FINANCIAL REPORT
MAY 1, 1963 — APRIL 30, 1964

INCOME

	Budgeted	Actual	1962-1963 Comparison
Retail Sales	$40,000	$34,911.78	$34,370.10
Sale of Seed	2,200	1,606.14	1,614.70
Sale of Cuttings and Plants	200	62.50	66.50
Contributions	500	570.09	853.11
Voluntary Admissions	11,000	10,733.27	9,387.05
Memberships	3,300	3,263.00	3,281.40
Wholesale (Books)	2,000	1,300.72	956.97
Endowment (Webster Trust)	10,500	10,700.00	10,509.93
	$69,700	$62,947.50	$61,039.76

EXPENDITURES

Purchasing for Resale	$22,000	$20,015.93	$22,718.76
General Expense	5,000	4,618.20	5,189.00
Buildings and Improvements	2,500	2,395.78	3,074.98
Auto Operation	600	869.85	517.08
Utilities	1,700	1,793.64	1,667.88
Insurance	1,400	2,500.56	1,373.78
Taxes	1.250	1,146.04	1,241.19
Salaries	23,000	20,722.00	19,460.11
	$57,450	$54,061.42	$55,242.78

ASSETS

Accounts Receivable (Books)	$ 163.85	$ 111.95
Inventory	9,201.49	8,275.47
Deposit—Arizona Industrial Commission	96.00	96.00
Cash—Valley National Bank—Checking	1,912.21	2,551.69
Valley National Bank—Building (Savings)	11,024.35	10,424.96
1st Federal Savings & Loan—(Savings)	1,716.28	1,400.52
Petty Cash	84.00	79.00
	$24,248.18	$22,939.59

LIABILITIES

State Withholding Tax	$ 8.92	$ 7.45
Accounts Payable	0	0
	$24,239.26	$22,932.14

OUTSTANDING EXPENDITURES (1963-1964)

Contribution to Director's Far-East Trip Expenses	$1 ,000.00
Compiled Index for Saguaroland Bulletin	106.00
Contributed to Univ. of Calif. Expedition to Andes	500.00
Added N.Y.L. Hospitalization & Life Ins. for Employees	1,075.68
Paved Parking Lot	4,576.78*
Parking Lines in Parking Lot	321.40*
Added 200 sq. ft. to Warehouse	391.54
Shop Equipment	284.21
Purchased 1961 GMC 1-Ton Platform Truck	1,650.15*
Purchased Ford-Ferguson Tractor with Attachments	1,552.50*
	$11,458.26

* From Savings fund at Valley National Bank.

Report on CACTI OF SOUTHWEST—Published February, 1963

5500 Soft Covers and 500 Hard Covers

Inventory 4/64 ..... 2366 Soft Covers and 87 Hard Covers

Counter Sales Have Been	$2,870.00
Wholesale Sales Have Been	1,782.00
Future Sales of 2,453Books @ $1.311	3,216.00
Total Sales of Book	$7,868.00
Production Cost of Book	3,080.00
Clearance	$4,768.00

ANTICIPATED BUDGET 1964-1965

INCOME

Retail Sales	$38,000
Sales of Seeds	1,800
Sale of Plants & Cuttings	100
Contributions	500
Voluntary Admissions	12,000
Memberships	3,400
Wholesale (Books)	1,000
Endowment	10,700
	$67,500

EXPENDITURES

Purchase for Resale	$21,000
General Operating Expenses	5,000
Buildings and Improvements	2,500
Car and Truck Operation	1,000
Utilities	1,800
Insurance	2,500
Sales Tax	1,200
Salaries	22,000
	$57,000

Membership—688 (1963-1964)
697 (1962-1963)

Attendance—89,093 (1963-1964)
90,371 (1962-1963)

The following groups met **at the Garden:**

57 Elementary School Classes	2,610
7 High School Classes	225
13 University Classes	229
15 Desert Plant Classes	604
57 Illustrated Lectures	2,014
8 Cactomaniac Meetings	597
17th Annual Cactus Show	11,424
1 Convention	30
1 Civic Organization	26
3 Church Groups	59
1 YMCA	197
1 Air Cadets	12
26 Boy Scouts, Cubs	336
19 Girl Scouts, Campfire Girls	302
2 Campfire Leader Groups	52

Lectures were given to the following groups **away from the Garden:**

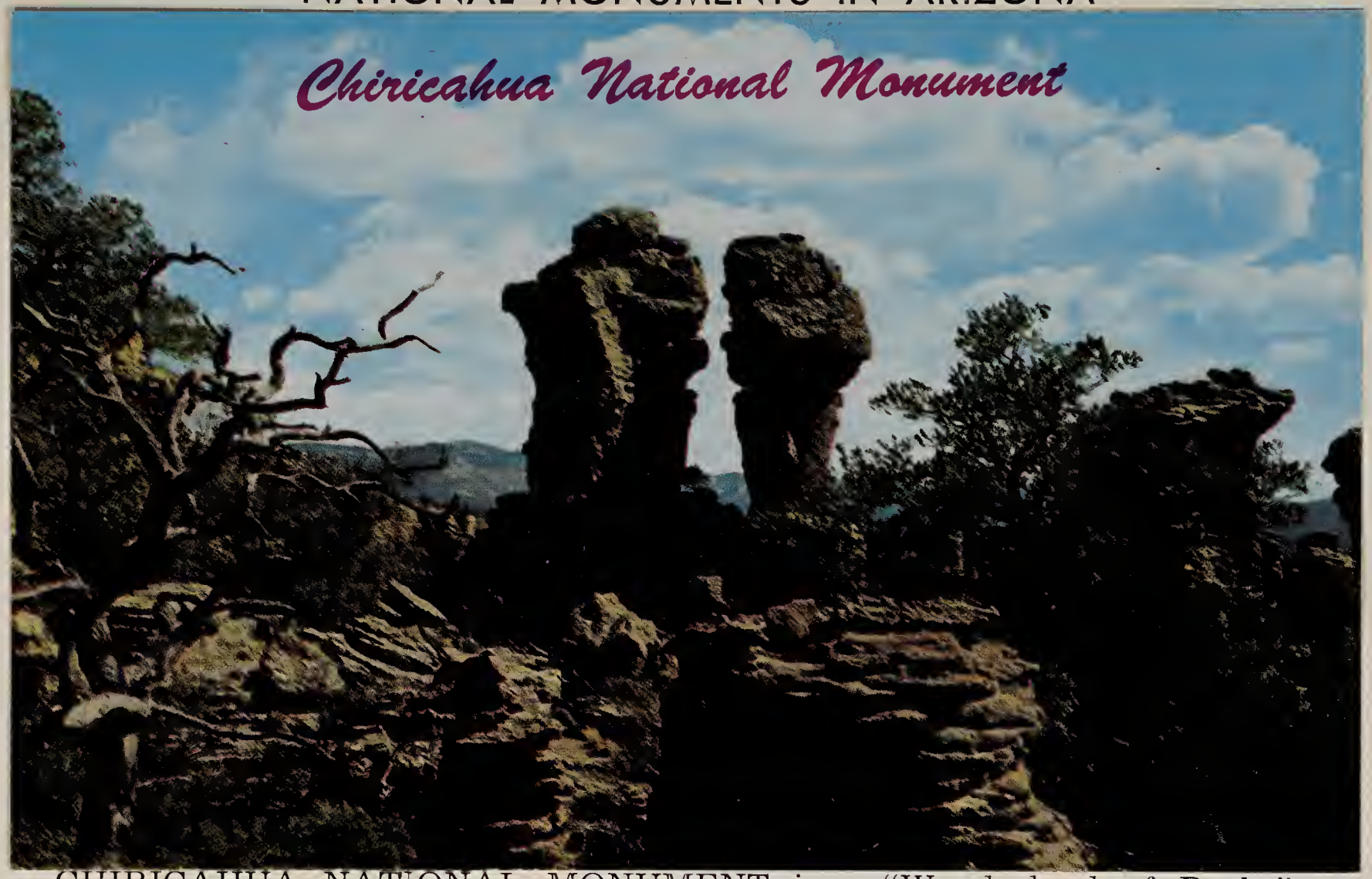
6 Desert Field Trips	182
1 Desert Institute	36
8 Garden Clubs	134
4 High Schools	233
1 University Seminar	65
5 Service Clubs	122
1 Senior Citizens	29
6 Church Groups	164
1 Girl Scout Leaders Trng.	22
1 Ariz. Landscape Contrs.	38
1 Nat'l. Cactus & Succ. Soc.	128
1 Nat'l. Service Foundation	64
1 YWCA Travel Talk	36
1 H. Gates Cactus Club	66

1964-1965 IMPROVEMENT PROGRAM

Erect 5,000 sq. ft. Aluminum Lath-house, Pave Paths, Build Beds and Plant with Leaf Succulents	$ 900
Rearrange paths, beds, and cacti in lath-house	200
Pave paths to new lath-house	150
Landscape new lath-house	200
Lay-out and grade roads in N. E. portion of Garden	300
Extend water lines	200
Addition to Archer House	3,500
Open addition to warehouse for tractor, truck, etc.	450
Build parking lot S. W. of Auditorium	200
Landscape entrance to Garden off Papago Parkway	500
	$ 6,608

May, 1964

NATIONAL MONUMENTS IN ARIZONA



CHIRICAHUA NATIONAL MONUMENT is a "Wonderland of Rocks" caused by the layering of many lava flows which with a gradual upheaval and erosion has formed a forested island of fantastic rocks amidst a surrounding desert. It is a fine place to study birds, animals, plants and is located in southeastern Arizona close to the towns of Bisbee, Douglas, Willcox and Bowie.

ACACIA CYMBISPINA—Sprague & Riley Fam. LEGUMINOSAE
BOAT-SPINED ACACIA, CUCHARITAS

By John H. Weber, Horticulturist

A 3 year old *Acacia cymbispina*, 4′ high and 4′ wide that was frosted last winter but quickly recovered.

DESCRIPTION:

Acacia cymbispina in shrub form has a short trunk with numerous spreading branches. An occasional specimen is seen that has attained tree form with a spreading crown arising from a short trunk. Height will range from two to eight meters, relative to form. The branches are heavily armed with broad and flat or curled boat-shaped spines. These spines are paired at each node and measure 5 mm. in width at the base and 1.5 cm. to 5 cm. in length. In color, they are red-brown at first, turning gray with age. The leaves are bipinnate with numerous dark green leaflets, each of which is 3 mm. or less in length. In late July and August after the seasonal rains have commenced, flowers consisting of fuzzy, yellow, globose heads appear. Ripening in the fall, the brown-black fruit is terete to partially compressed and will extend to 10 cm. in length. The seed is light brown in color and oval in shape, measuring 4 mm. by 6 mm.

DISTRIBUTION:

The boat-spined acacia is not specific as to habitat type and is found occupying lowland and valley situations as well as foothill and rocky hillside sites. Elevational range is from 30 meters to 900 meters where the plants most frequent in association with ACACIA CYMBISPINA are LYSILOMA DIVARICATA and RANDIA ECHINOCARPA.

Geographic distribution is limited to Mexico from the state of Chihuhua to the Baja California peninsula and south into Pueblo and Chiapas. On the foothills of southern Sonora it is found at San Bernardo, Los Tanques, Alamos, Tesopaco, Mescales, and near Sierra Saguaribo. It also is growing on the coastal plain south from Guaymas and Navajoa into Sinaloa where it is very common.

UTILIZATION:

For ornamental purposes, ACACIA CYMBISPINA would be employed primarily for the unusual effect created by the broad, flaring, boat-like spines. Being a widespread open plant, it may be used as a foundation shrub or as an individual specimen plant when removed from structural association. Having a heavy armament limits its employment to areas of light foot traffic. Selectively pruned branches are suitable for use in floral and dried arrangements.

CULTURE:

The boat-spined acacia is subject to freeze damage, but recovery is rapid with the advent of warm weather. Requiring more water than most low desert plants, biweekly irrigations on well-drained soils should be applied during the dry months of summer. Heavy mulching with manure will reduce ground moisture loss and will promote new growth. A protected location preferably on a south exposure is desirable.

PROPAGATION:

A very hard seed coat necessitates pretreatment to overcome impermeability. Mechanical scarification, hot water, or acid treatment will achieve this end. Germination and growth rates are rapid with best results obtained by growing the seedlings for one season in containers then planting them direct. Protection from rodent damage should be provided. The seed is subject to weevil infestation and should be fumigated if it is to be stored.

REMARKS:

One of ten large-spined mexican acacias that are of interest for ornamental purposes. A greater exploitation of this genus in landscaping should be made, for many species from northern Mexico and from western Australia are adaptable to conditions existing in southern Arizona and California.

A branch of *Acacia symbispina* showing the leaves and the boat-shaped brown spines.

REFERENCES:

Gentry, H. S.—Rio Mayo Plants.

Goldman, E. A.—Biological Investigations in Mexico.

Pesman, M. W.—Meet Flora Mexicana.

Shreve, F.—Vegetation of the Sonoran Desert.

Standley, P. C.—Trees and Shrubs of Mexico.

Apache Junction
March 4th, 1964

Mr. Hubert Earle

Desert Botanical Garden

Dear Mr. Earle:

Your Seventeenth Annual Cactus Show was an outstanding success in many areas; it brought natural beauty to many winter visitors who otherwise would never have viewed the many natural wonders of amazing Arizona.

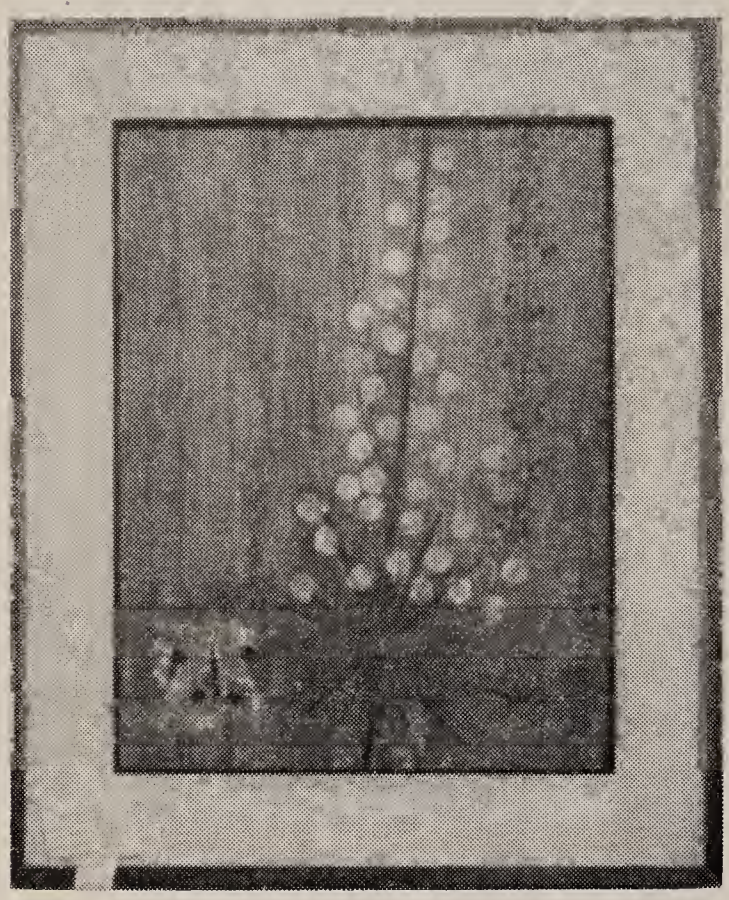
My sincere congratulations to you and your very dedicated staff and associates.

Sincerely,

(Signed) Franklin Girard

R. #2, Box 434E

Apache Junction, Arizona

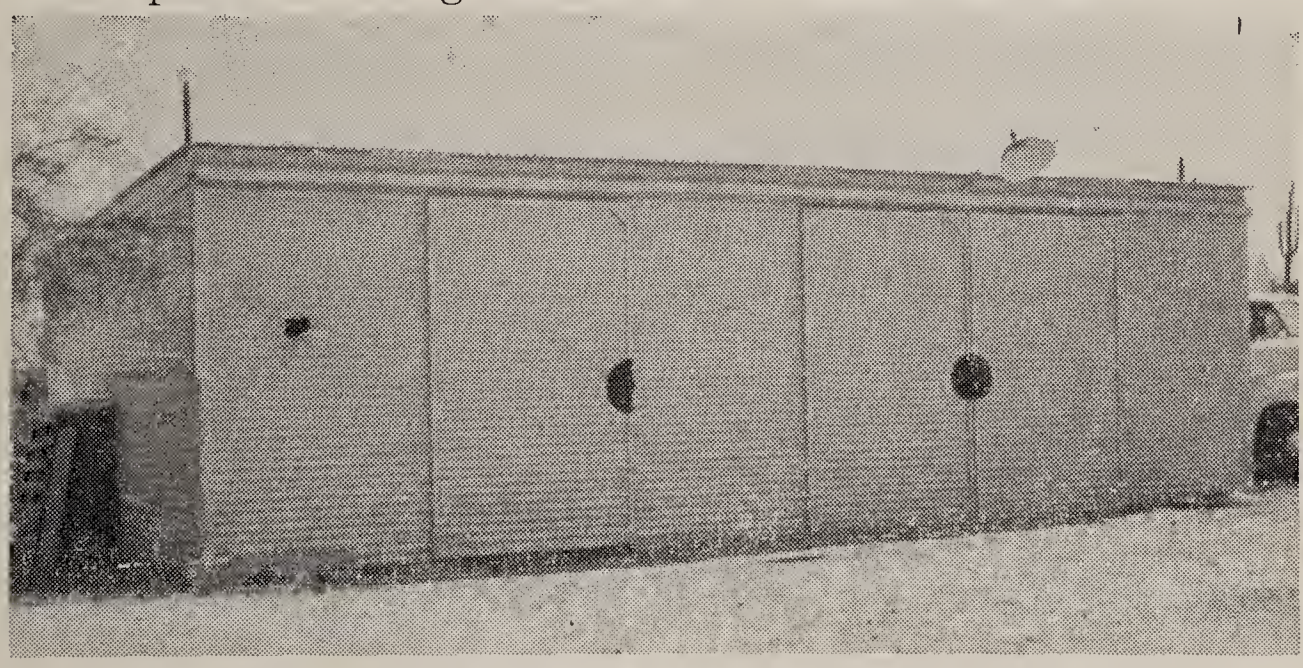


An unusual and eye-catching picture made up of various colored tissue papers glued to a background. Entered by Bill Jamieson.

HOYA CARNOSA var. VARIEGATA (Wax plant) entered in the educational exhibit by Mrs. Maribel Pratt and John Hales. These climbing milkweeds are very hard to grow in our area due to the low humidity. Mrs. Pratt has been successful by spraying the plants daily with a fine water mist during hot periods. They are grown indoors and prefer air cooled by refrigeration. They are natives of China, East India, Malayan Islands and Australia.

A 1-ton GMC truck with flat platform, hoist and high racks bought in April. It is compact, stury and well suited for Garden jobs and travel.

A late model Ford-Ferguson tractor with hydraulic lift front bucket, rear leveler, scarifier and grader. This will have many uses needed to get jobs completed in the garden this summer and the future.



A 10′ x 20′ addition for storage was added to the left side of the Warehouse. The complete unit was then painted to match the other garden buildings.

A 2 in 1 Castus? No! Just seeds of *Opuntia engelmannii* carried by birds and dropped amongst the arms of *Carnegiea gigantea*. The seeds of the prickly-pear germinated and formed the plant resting on the arms of the Saguaro. This plant was found and photographed by Mr. Charles F. Waldron, 2221 E. Cambridge, Phoenix,

Another Webster Auditorium educational exhibit made by Larry Kellner. The Reader's Digest Magazine contributed towards the purchase of these Navajoa wool samples of plants used to dye the wool.

Free Public Activities At
Desert Botanical Garden Auditorium – 1964-1965
In Papago Park

5800 E. Van Buren & 6400 E. McDowell Streets, Phoenix, Arizona

GARDEN is open daily 9 A.M. - 5 P.M. including week-ends and holidays.

ILLUSTRATED LECTURES are given each Thursday at 3 P.M., and also on Sundays at 3 and 4 P.M. with the use of colored slides for 35 minutes.

CLASSES in "A Better Understanding, Identification and Use of Desert Plants" is given for one hour each Wednesday November through April.

		OCTOBER	
Tues.	6th	CACTOMANIACS meeting	8 P.M.
		NOVEMBER	
Tues.	3rd	CACTOMANIACS meeting	8 P.M.
Wed.	4th	CLASS—Deserts, how formed and their plants	3 P.M.
Thurs.	5th	LECTURE—Arizona Cacti in Flower	3 P.M.
Sun.	8th	LECTURES—Arizona Cacti in Flower	3 & 4
Wed.	11th	CLASS—Desert Succulent Plants	3 P.M.
Thurs.	12th	LECTURE—Arizona Wildflowers	3 P.M.
Sun.	15th	LECTURES—Arizona Wildflowers	3 & 4
Wed.	18th	CLASS—Culture of Succulent Plants	3 P.M.
Thurs.	19th	LECTURE—Arizona Trees & Shrubs in Flower	3 P.M.
Sun.	22nd	LECTURES—Arizona Trees & Shrubs in Flower	3 & 4
Wed.	25th	CLASS—Identification of Trees & Shrubs	3 P.M.
Thurs.	26th	LECTURE—Arizona Birds & Animals	3 P.M.
SUN	29th		3+4
		DECEMBER	
Tues.	1st	CACTOMANIACS meeting	8 P.M.
Wed.	2nd	CLASS—Culture of Desert Trees & Shrubs	3 P.M.
Thurs.	3rd	LECTURE—Arizona Scenics	3 P.M.
Sun.	6th	LECTURES—Arizona Scenics	3 & 4
Wed.	9th	CLASS—All-day Desert Field Trip	9 A.M.
Thurs.	10th	LECTURE—Leaf Succulent Plants	3 P.M.
Sun.	13th	LECTURES—Leaf Succulent Plants	3 & 4
Thurs.	17th	LECTURE—Collecting Plants in Mexico	3 P.M.
Sun.	20th	LECTURES—Collecting Plants in Mexico	3 & 4
Thurs.	24th	LECTURE—Arizona Cacti in Flower	3 P.M.
Sun.	27th	LECTURES—Arizona Cacti in Flower	3 & 4
Thurs.	31st	LECTURE—Arizona Wildflowers	3 P.M.
		JANUARY	
Sun.	3rd	LECTURES—Arizona Cacti in Flower	3 & 4
Tues.	5th	CACTOMANIACS meeting	8 P.M.
Wed.	6th	CLASS—Deserts, How Formed and their Plants	3 P.M.
Thurs.	7th	LECTURE—Arizona Cacti in Flower	3 P.M.
Sun.	10th	LECTURES—Arizona Wildflowers	3 & 4
Wed.	13th	CLASS—Desert Succulent Plants	3 P.M.
Thurs.	14th	LECTURE—Arizona Wildflowers	3 P.M.
Sun.	17th	LECTURES—Arizona Trees & Shrubs in Flower	3 & 4
Wed.	20th	CLASS—Culture of Desert Succulent Plants	3 P.M.
Thurs.	21st	LECTURE—Arizona Trees & Shrubs in Flower	3 P.M.
Sun.	24th	LECTURES—Arizona Birds & Animals	3 & 4
Wed.	27th	CLASS—Identification of Desert Trees & Shrubs	3 P.M.
Thurs.	28th	LECTURE—Arizona Birds & Animals	3 P.M.
Sun.	31st	LECTURES—Arizona Scenics	3 & 4

(Over)

5/64

FEBRUARY

Tues.	2nd	CACTOMANIACS meeting	8 P.M.
Wed.	3rd	CLASS—Culture of Desert Trees & Shrubs	3 P.M.
Thurs.	4th	LECTURE—Arizona Scenics	3 P.M.
Sun.	7th	LECTURES—Leaf Succulent Plants	3 & 4
Wed.	10th	CLASS—All-day Desert Field Trip	9 A.M.
Thurs.	11th	LECTURE—Leaf Succulent Plants	3 P.M.
Sun.	14th	LECTURES—Arizona Cacti in Flower	3 & 4
Sun.	21st to 28th	18th ANNUAL CACTUS SHOW	9-5 P.M.

MARCH

Tues.	2nd	CACTOMANIACS meeting	8 P.M.
Thurs.	4th	LECTURE—Arizona Cacti in Flower	3 P.M.
Sun.	7th	LECTURES—Arizona Wildflowers	3 & 4
Wed.	10th	CLASS—Deserts, How Formed and Their Plants	3 P.M.
Thurs.	11th	LECTURE—Arizona Wildflowers	3 P.M.
Sun.	14th	LECTURES—Arizona Trees & Shrubs in Flower	3 & 4
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Sun.	28th	LECTURES—Arizona Scenics	3 & 4
Wed.	21st	CLASS—Identification of Desert Trees & Shrubs	3 P.M.

APRIL

Thurs.	1st	LECTURE—Arizona Scenics	3 P.M.
Sun.	4th	LECTURES—Leaf Succulent Plants	3 & 4
Tues.	6th	CACTOMANIACS meeting	8 P.M.
Wed.	7th	CLASS—Culture of Desert Trees and Shrubs	3 P.M.
Thurs.	8th	LECTURE—Leaf Succulent Plants	3 P.M.
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Sun.	25th	LECTURE—Arizona Trees & Shrubs in Flower	3 & 4
Thurs.	29th	LECTURE—Arizona Trees & Shrubs in Flower	3 P.M.

MAY

2nd-5th National Cactus & Succulent Society 11th Biennial Convention at the Phoenix Sands Hotel and the Garden. The second half of convention—
6th-8th Tucson Sands Hotel and Tucson Cactus & Botanical Club.

JUNE, JULY, AUGUST, SEPTEMBER, OCTOBER The Garden is open daily 9 A.M.-5 P.M. including week-ends and Holidays.

* * * * *

The DESERT BOTANICAL GARDEN is a non-profit educational institution and supported only by memberships, endowments and contributions. MEMBERSHIP applications are available for you at the Book and Gift Shop in the VISITORS' RECEPTION BUILDING.

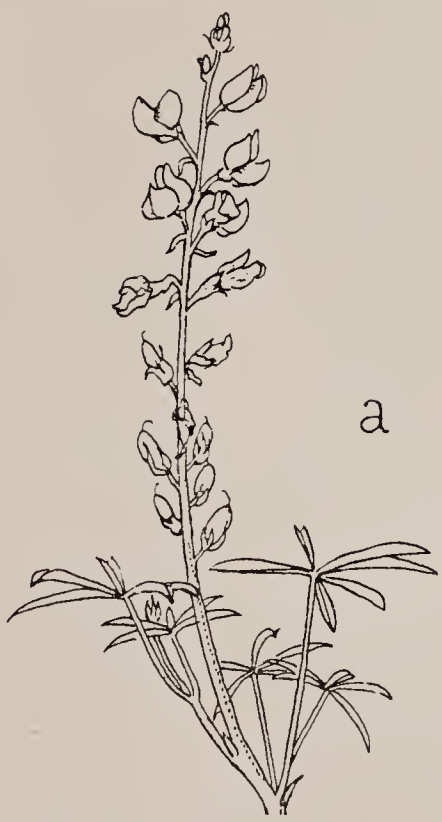
For additional information phone 947-2800.

(Over)

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVIII June-July, 1964 No. 6



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Desert Lupine *Lupinus sparsiflorus*

See page 66

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona. P. O. Box 5415, Phoenix 10. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor
LILLIAN DIVEN, Ass't. Editor

Volume XVIII | June-July, 1964 | No. 6

Arizona Cactus and Native Flora Society

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Including Week-ends and Holidays

FOUQUIERIA MACDOUGALII Nash Fam. FOUQUIERIACEAE

TOROTE SPINOSA

TOROTE VERDE

By John Weber, Horticulturist

DESCRIPTION:

FOUQUIERIA MACDOUGALII is a thorny, short trunk tree or tall shrub. The widespread stems are secondarily branched and armed with one to two centimeter long spines. A main trunk measuring up to 20 cm. in thickness varies in color from yellowish green to brown. Under optimum growth, an overall height of eight meters may be reached. Leaves are broadly ovate to lance-shaped with rounded or acute tips and may be as much as four cm. in length. Foliage is deciduous during periods of extended drought. The bright red flowers are clustered in a paniculate inflorescence and are in evidence in early and mid-summer. An individual flower has a cylindric corolla tube with short lobes, measuring overall to 2.5 cm. in length. The flower is borne on a long slender pedicel and has 10 to 15 stamens. Splitting along lateral lines, the capsulate fruit releases thinly compressed seeds having membranous wings. These are primarily dispersed by wind.

Flowering stalk of *Fouquieria macdougalii*

DISTRIBUTION:

FOUQUIERIA MACDOUGALII grows in open exposures on hillsides, mesas, and washes. It is found on rocky and sandy situations ranging from 150 to 750 meters in elevation. Other plants in common association with this species are: CERCIDIUM SONORAE, GUAIACUM COULTERI, CEIBA ACUMINATA, and OLNEYA TESOTA.

The type locality for Torote Spinosa is Torres, Sonora Mexico. It has a limited distribution; the northern limit being the plains of Sonora. There it is found from Carbo east to Moctezuma and from there south to Alamos. Within this area it is recorded also at San Bernardo, Navajoa, and Alamos.

UTILIZATION:

FOUQUIERIA MACDOUGALII has been little used in desert landscaping and is found in very few collections. It could be employed in much the same way that Ocotillo (FOUQUIERIA

SPLENDENS) is. As an accent or specimen plant when in combination with cacti, yuccas, and agaves, it would be particularly attractive. Hummingbirds and other nectar feeding birds visit this species regularly during the flowering period.

CULTURE:

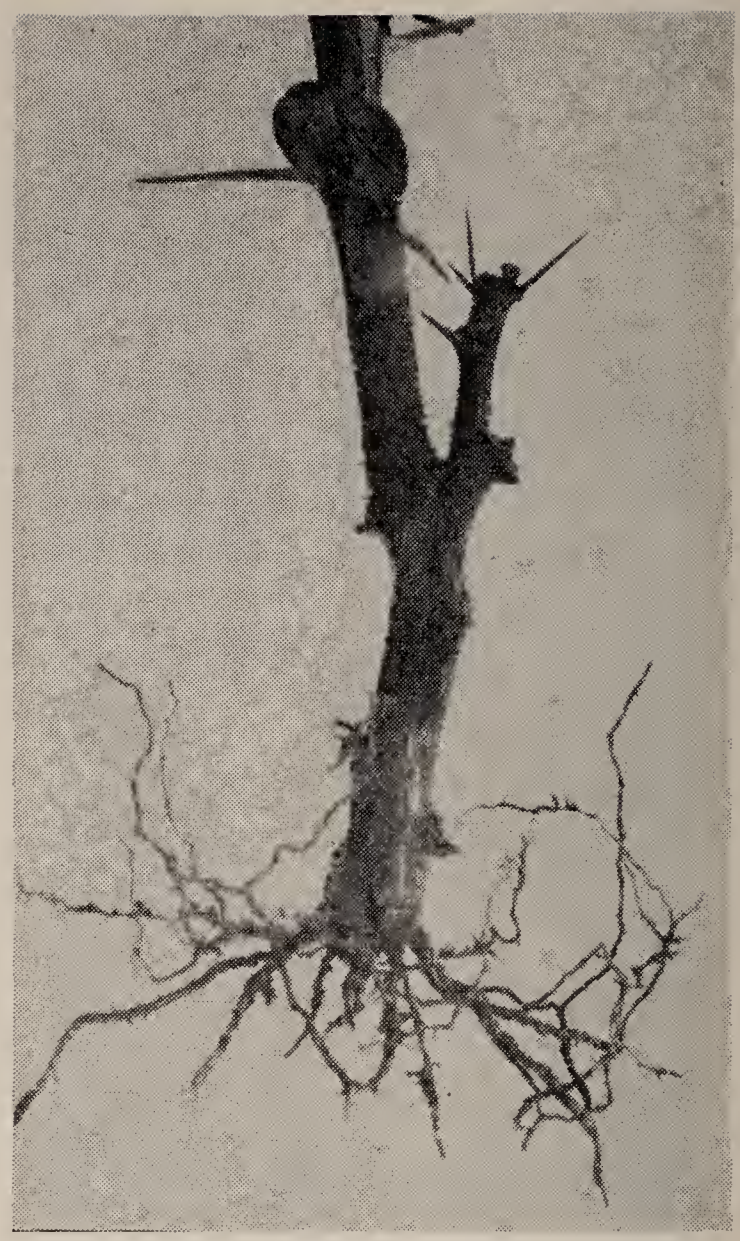
A protected site in near frost free areas is required for Torote Spinosa. It is much more subject to freeze damage than is the Ocotillo. For optimum growth, a rocky or sandy well-drained soil would be required. Semi-monthly watering should be applied during warm months or periods of prolonged drought. Spatial needs of this plant, in the adult form, are considerable so it should not be installed too near structures or other plants.

PROPAGATION:

Propagation of FOUQUIERIA is by means of seed or cuttings. Germination of fresh seed is rapid with no pretreatment being necessary. The rate of growth of both seedlings and cuttings is quiet slow so that utilization of long cane cuttings provides a quick method of attaining a mature plant. Make stem cuts with a sharp knife, dip the cut end in rooting hormone, and plant into containers or directly into the ground.

REMARKS:

In its largest form FOUQUIERIA MACDOUGALII is a magnificent plant, but it is doubtful that it would attain such proportions in cultivation except in totally frost free areas.



A *Fouquieria macdougalii* cutting showing a four month growth of newly formed roots.

REFERENCES:

Gentry, H. S., Rio Mayo Plants.

Shreve, Forrest, Vegetation of the Sonoran Desert.

Standley, P. C., Trees and Shrubs of Mexico.

Another honor has come to the Garden in that your Editor and Garden Director has been elected a FELLOW by the American Association for the Advancement of Science which was founded in 1848.

Please note Garden's new phone number—947-2800

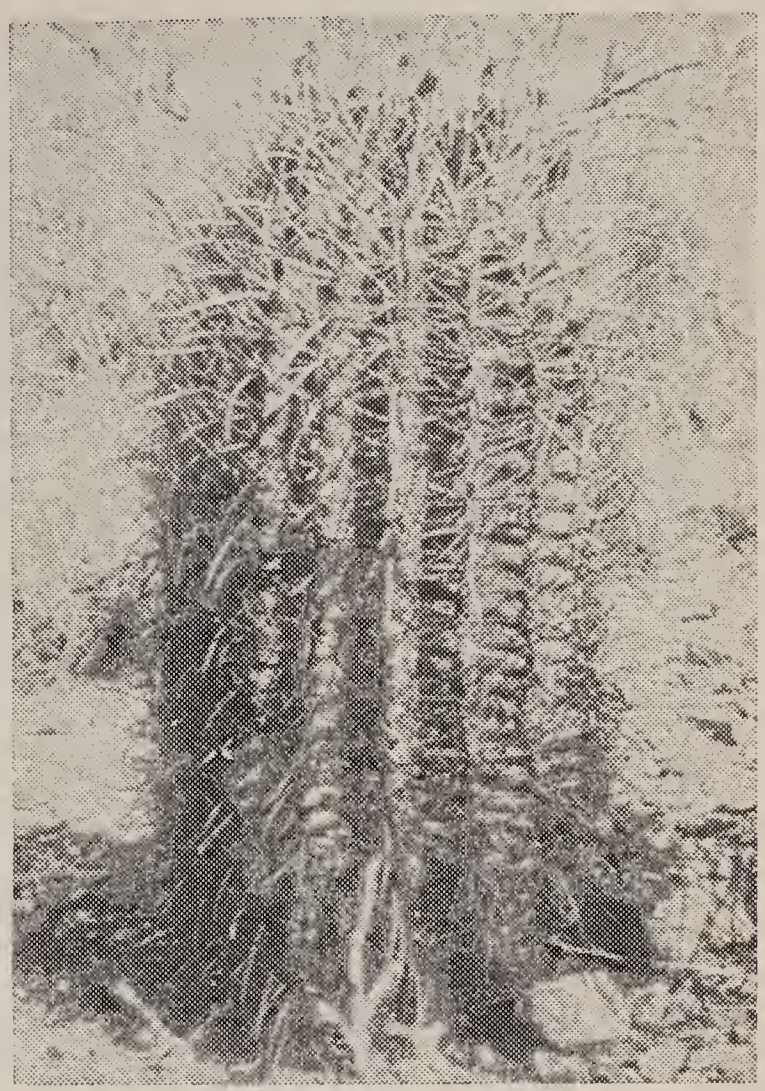
FEROCACTUS ACANTHODES (Lemarie) B.&R.

Fam. CACTACEAE

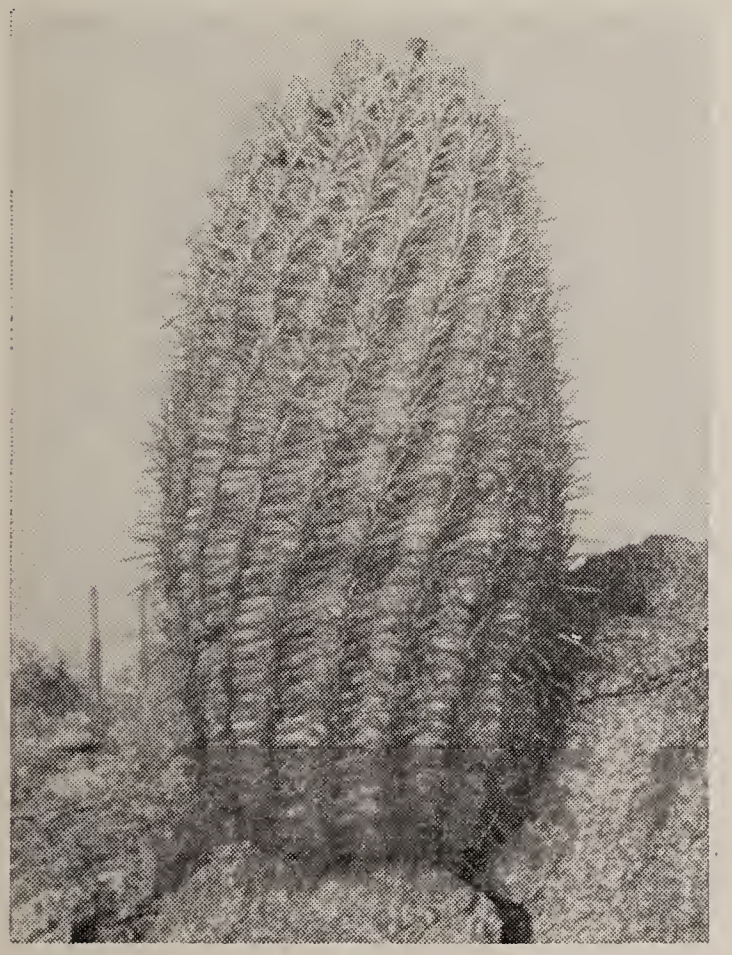
COMPASS or CALIFORNIA BARREL

FEROCACTUS (ferocious cactus) ACANTHODES (many spines) is one of the three southwestern barrels that does not have a woolly apex and fruit as do those of the genera ECHINOCACTUS.

The plant is at first globose when young but later on becomes cylindrical, 3′-10′ tall, 12″-15″ in diameter. The central spines are 3-4, slender, one longer than the others, flattened, twisted, curved downward but not hooked, 3″-4½″ long. The radial spines 6-12 are weak, usually white, spreading, often concealing the body of the plant. The flowers appear in late April and early May, are light to dark yellow sometimes streaked with ribs of carmine, about 1½″-2″ in diameter. The fruit is a scaly yet sometimes smooth ovary of yellow-brownish color; it is quite dry and bears hundreds of black seeds that dehisce through the fruit's basal pore or valve.



Ferocactus acanthodes 32″ tall growing in rocky soil, southern California



Ferocactus acanthodes, 36″ tall, growing in rock crevice along Bee-Line Highway, Arizona

The fruits are sometimes eaten whole by browsing animals but the seeds are relished by birds and rodents.

The name compass has been applied to the plant because of its tendency to lean to the south or southwest. This is caused by the sun's hot rays shining from the southwest that dry out the cells causing that side of the plant to contract. The cells on the northeast shaded side grow normally and thus tend to push over the plant. This contracting and growing caused the plane of the plant's apex to slant to the south or southwest, hence the common name —Compass Barrel.

This species is the predominant barrel cactus of southern California, hence the common name—California Barrel.

In the transplanting of this barrel, all broken roots should be trimmed off and the roots allowed to callus before planting. If in doubt as to the proper side to expose to the hot sun, plant the plant with its sloping apex to the southwest. These barrels need very little watering after planting, possibly once a month is sufficient, only during the summer.

Contrary to popular belief these barrels do not contain water for the weary traveler. They take in water through their roots and convert it into a mucilagnous juice which is stored within for future use. This juice is sticky, acrid in taste and unsuitable for human consumption.

TYPE LOCALITY: California

DISTRIBUTION:

Southeastern California, southwestern Arizona, southern Nevada and northern Sonora.

Ferocactus acanthodes 8′-0″ tall with 3′-6″ offset growing on rocky hillside near the Garden.

LUPINUS SPARSIFLORUS Benth. 1848 Fam. LEGUMINOSAE
ARIZONA LUPINE

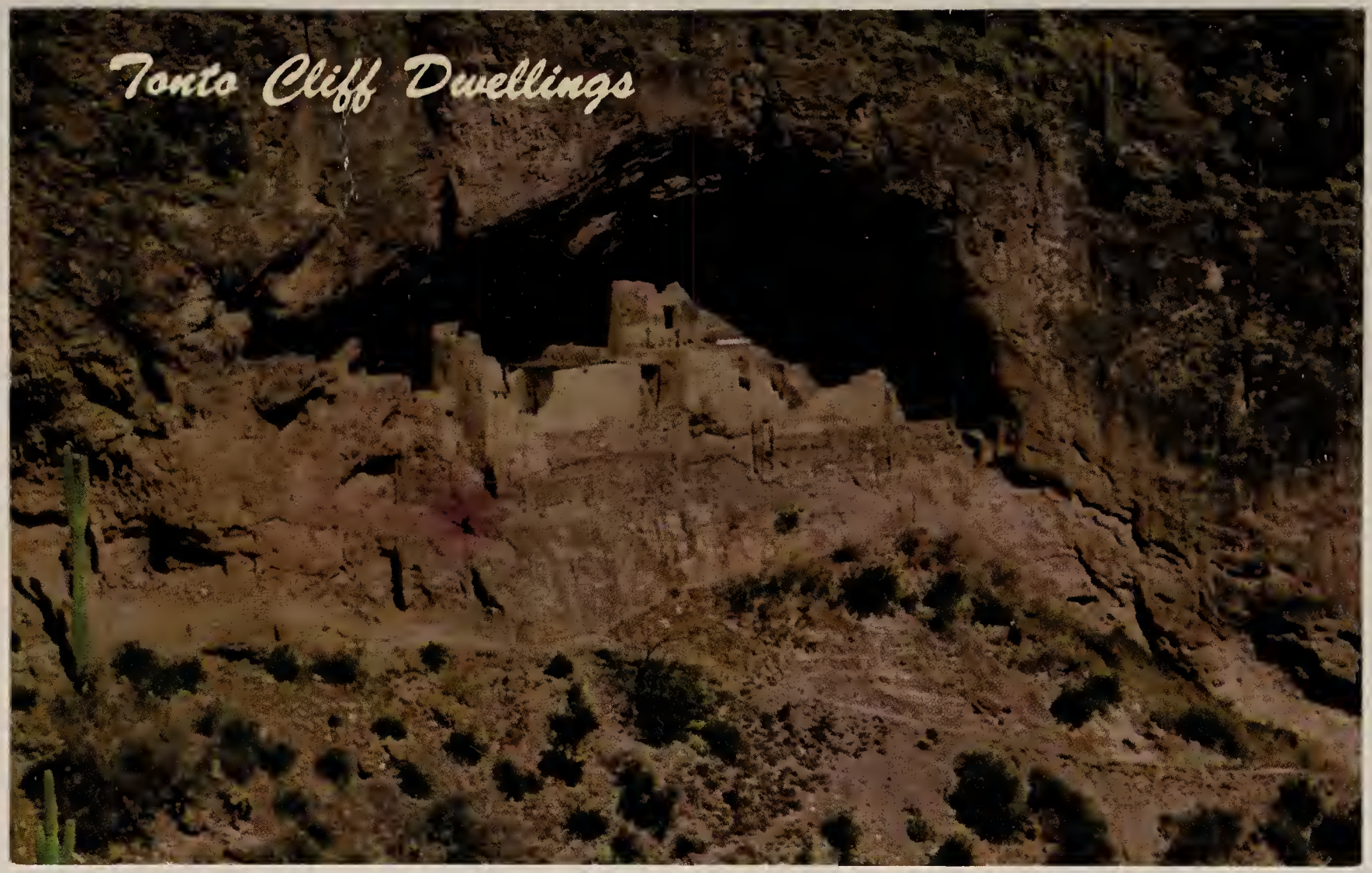
An annual sparse-flowered lupine with rich violet blossoms that will cover large areas with a carpet of color in the spring if there has been good winter and late spring rains, otherwise it can be found sparsely in areas where the rainfall is light.

It is found in Mohave, Graham, Gila, Maricopa, Pinal, Pima and eastern Yuma counties of Arizona. Its full range extends from southeastern California, southern Nevada to southern New Mexico and through northern Sonora, Mexico, below 4500′. It prefers sandy soil but is found in mesas and foothills which are usually quite rocky. It will start blossoming in January at the lower elevations and until early May up to the higher elevations.

It is a good range plant for cattle, deer and sheep. Its seeds are eaten by many different birds. An eye catching border of these plants in flower is usually seen each year along the edge of the pavement of the Pinal Pioneer Parkway between Florence and Oracle Junction.

Arizona Lupine can be used successfully in a desert garden and they will reseed each year but should be planted rather heavy so that they will form a mass of color. Seed can be obtained from wildflower seed collectors or you can gather them yourself in late April or through May.

NATIONAL MONUMENTS IN ARIZONA



TONTO NATIONAL MONUMENT, on the Apache Trail overlooking Roosevelt Lake, is the site of this cliff dwelling, built by Pueblo Indians about 600 years ago. It was originally 2 stories high, and had over 25 rooms. Curious T-shaped doorways are found here, narrow at the bottom to keep an enemy from entering, but wide at the top so that bulky items could be brought inside.

Pacific On Parade—Singapore—Singapore Botanic Gardens

Mrs. Earle and staff members guide Abdul Aziz Pakire walking towards the Singapore Botanic Garden office and herbarium.

Singapore on an island off the southern tip of Malaya Peninsula had been a city of great importance until it was devastated by the Japanese in 1377. It lay in ruins until 1819 when Thomas Stamford Raffles concluded an agreement with the Malay Governor and the Sultan of adjacent Johore to establish a trading post for the East India Company which would then be a base from which it could compete with the Dutch companies.

Under Raffles' careful planning and supervision, the British Crown Colony became an important international "free-port" and a major seaport of world trade. The island, 27 miles long and 8 miles wide, is now connected to the mainland with a ¾ mile causeway across the Strait of Johore.

During World War II the island again fell to the Japanese until 1945 when it came under British Military Administration. Later a self-governing state was created in 1959 within the British Commonwealth. While your editor and wife were visiting Singapore in June, 1963, the citizens were quite excited about concluding the formation of Malayasia which included Singapore and the Federation of Malaya to be in effect August 1963.

Singapore, only 1 degree north of the equator, is a clean city of great charm, peopled by numerous races wearing colorful costumes. Due to the even temperature there are no seasons which would cause vegetation to burst into color. The soil is not the best, yet a remarkable job has been done in introducing plants that have become the backbone for the commerce of the Federation of Malayan States.

Credit for these introductions is given to the Singapore Botanic Gardens, established in 1822, and its hard working staff members. In 1822 Raffles introduced nutmegs, cloves and cocoa. Later economic plants of gutta-percha, rubber producing trees, cinchona, tea, maize, sugar cane, cola nuts, fruits, dyes and drug plants were established.

In 1880 a herbarium was started at the Gardens that is the world source of information for indigenous and exotic plants of the Malaysian region. The herbarium now contains over 400,000 sheets, many having specimens over 150 years old yet in still excellent preservation despite storage in wooden cupboards with no air-conditioning. The collection is arranged according to the Benham & Hooker system.

The Singapore Botanic Gardens since its inception has gone through six phases. It is now in its seventh phase under the direction of H. M. Burkill who in 1954 was made Assistant Director. His father, I. H. Burkill, was appointed Director in 1912, having been on the staff of the Calcutta Botanic Garden.

The Garden is a place of quiet and beauty amidst a very busy city. Monkeys running loose through the gardens are a bane to the staff but enjoyed and fed by visitors. Electrified high woven wire fences keep the monkeys from destroying blossoms of the many world famous orchids created here since 1929. Over 4000 crosses of the 800 Malayan species have made to date with orchids from New Guinea, Philippines, Burma and Java. Much pioneering in the growing of orchids from seed has been done at the Garden.

A formal garden of succulents. The vine-covered walkways formerly housed many orchids.

FLORA & HORTICULTURE OF SINGAPORE*

When Raffles landed in Singapore the Island was covered with forest. Much of this has now been destroyed and plants, which were collected here 60 years ago, have disappeared from the flora. They include a few endemic species which were peculiar to the Island and a great number which do occur elsewhere. Some 50 species of orchids which used to grow in the mangrove swamps can no longer be found. A few remaining remnants of the original vegetation are now conserved by a statutory Board of Management, established in 1951, of which the Director of the Botanic Gardens is the ex-officio Chairman. Only a comparatively small area of the 9,000 acres of Nature Reserves, which are set aside for

*Reprint from "Colony of Singapore Annual Report 1955".

Hoya carnosa (wax-plant), a tropical succulent milkweed climbing up through trees.

the propagation, protection and preservation of the indigenous fauna and flora, consist of primary vegetation; much of it is secondary, but it is hoped, that, with the prohibition of settlement and tree felling, regeneration will advance.

The Bukit Timah Nature Reserve, covering 163 acres on the highest hill on the island, is one of the most important areas of preserved vegetation in the world. It has been a botanical collecting ground for more than a century and the first-known specimens of many Malayan plants were collected here. It is the only place in Singapore where many indigenous species still survive. It consists of primary tropical rain forest with many trees 50-70 metres high and for the greater part it has not been cut over or damaged. It is only 7 miles from the center of the town, while the next nearest area of virgin forest is on Gunong Pulai about 45 miles away in Johore. In the water catchment area, adjoining Bukit Timah, there is fresh-water swamp forest and peat swamp forest; and on the southwest and north coasts of the Island are areas of mangrove forest. All these areas are now Nature Reserves.

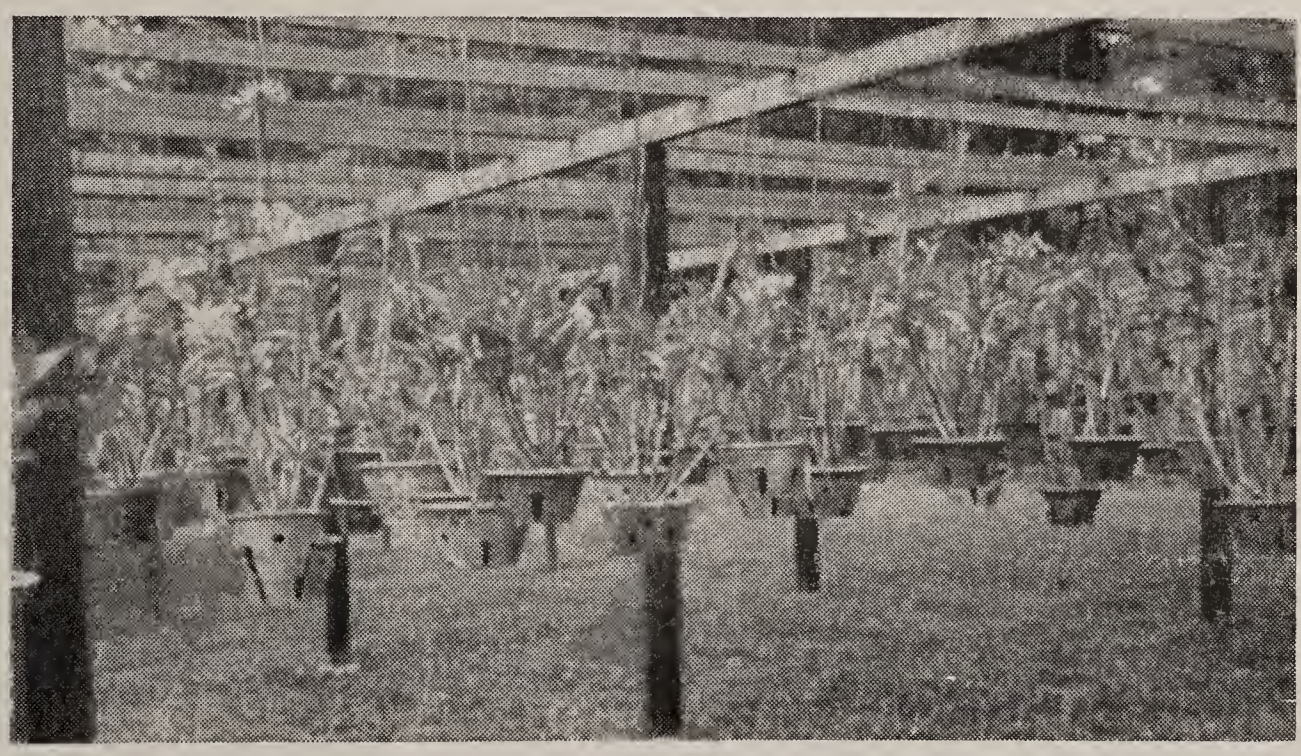
The natural vegetation is typical of a humid tropical climate in which seasonal changes are slight. Trees provide the dominant feature and green the dominant colour. Except in the mangroves, where because of the peculiar environment there are comparatively few kinds of plants, the lowland forest is one of bewildering complexity and is richer in plant species than other types of vegetation found elsewhere in the world. The forest is evergreen and is composed entirely of broad-leafed trees with very few conifers. It is never bare of leaves and those trees which are deciduous shed their leaves and acquire a new set rapidly, never standing leafless for more than a few days. Because seasonal changes are so slight there is no burst of flowering as occurs in climates with a cold or dry season. In fact very few flowers are seen at any time. The forest floor is covered with leaf mould, in which tree seedlings, ferns and a few herbs grow sparsely. Epiphytic plants are abundant, mostly orchids and ferns, which grow mainly on the upper branches of trees in order to reach the light. They are not parasitic, but have no connection with the ground. Grasses and sedges are plants of the open and only come in after the forest has been cleared.

Outside the urban areas and Nature Reserves, wherever the soil is suitable, rubber, coconuts, fruit trees and vegetables are cultivated. On the poorer eroded

and exhausted soils secondary scrub (**belukar**) is found, in which **lalang** is usually the dominant grass, but even here plants of interest, such as the pitcher plants, occur. With the opening up of large areas and the destruction of natural vegetation which has gone on for many years, alien plants, including many weeds of American and African origin, have become established and are now a familiar feature of the vegetation. The number of indigenous plants on Singapore Island is about 2,000, which is greater than the number of native species in the entire British flora.

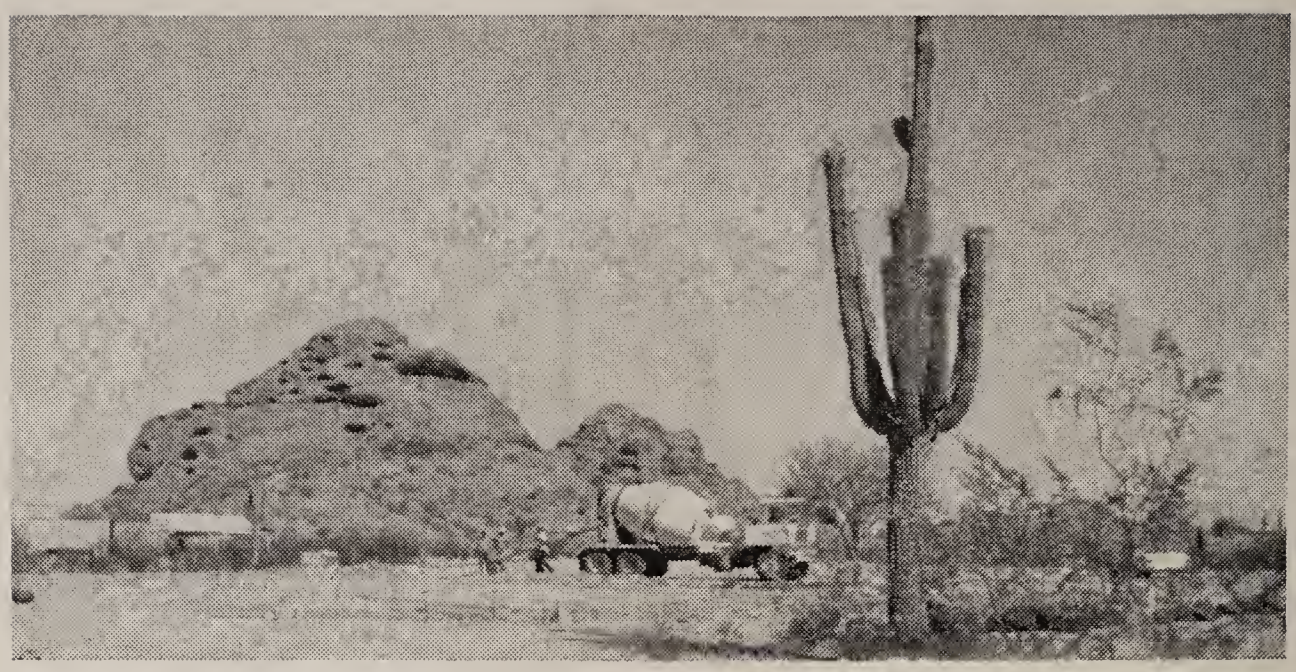
The Botanic Gardens, situated in the Tanglin area, are a popular public park and are also a center of research for Mayalsian botany and tropical horticulture. The present Gardens of 85 acres were founded on their present site in 1859, although there were earlier Gardens founded by Raffles on Fort Canning in 1822. Apart from purely decorative plants, the Botanic Gardens maintain collections of native and exotic plants of interest to the student and the botanist. It is manifestly impossible to show in a limited area anything more than a small sample of the Malaysian flora, which contains between 20,000 and 30,000 species, as well as related plants from other countries. Nevertheless, the number of trees, shrubs, climbers and other perennial plants growing in the Gardens and in the 11 acres of original forest preserved in the Garden's jungle is in the order of 3,000 species, and this does not include horticultural varieties and annuals. In addition to the more general collections, the Gardens has specialized in individual collections of certain families of plants, notably palms, bamboos, orchids, gingers and ferns. These are added to by collections within Malaysia and by exchange with institutions elsewhere. During the year a weekly exhibition has been staged for seven common Singapore plants, giving their scientific, English and Malay names and some notes on each plant. This has proved of interest to teachers and students and to the public.

(Continued In Next Issue)



Hybrid orchids growing in hanging well-drained split-clay pots.

GARDEN BUILDING PROGRAM



Concrete being poured for footings of new 5000 sq. ft. leaf-succulent lathhouse.

Filling concrete block stem with cement for foundations of new lathhouse. Now that the Garden is within the Phoenix city limits we have to comply with all building codes.

Our heavy building program during the past summer and fall has caused us to get behind in the publishing of these Bulletins. Fortunately we now have Lillian Diven who will be our Assistant Editor, and the late publications will be forthcoming. We certainly apprecite your patience in waiting for your Bulletins.—Ed.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVIII Aug.-Sept., 1964 No. 7

Fruit x 1 2/3 of *Ibervillea sonorae*.
See page 75.

REG-MANNING

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Desert Botanical Garden of Arizona

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Student Horticulturist ..... Terry Truesdell

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Including Week-ends and Holidays

IBERVILLLEA SONORAE (Wats.) Greene

Fam. CURCURBITACEAE

By John H. Weber, Horticulturist

DESCRIPTION:

IBERVILLEA SONORAE is a perennial vine having several thin stems. These are two to three meters long and bear long coiled tendrils. A nearly globose caudex is often flattened on top. From the thickened root zone are extended numerous fibrous roots. Leaves are small and palmate; the lateral lobes being two cleft. All parts of the plant are glabrous. The flowers are small; the corolla pale yellow. The plant is dioecious having staminate flowers in short caremes and solitary pistillate flowers in axillary positions. Fruit is globose and berrylike with a smooth surface. Each fruit contains several seeds which are rounded at the large end.

DISTRIBUTION:

IBERVILLEA SONORAE is limited to the sonoran zone on both sides of the Gulf of California. It ranges across Sonora into Baja California, Mexico. In Sonora it is common from Navajoa to Alamos.

Habitat of this plant is at low elevations within the thorn forest on lowland plains and hill slopes. Tubers are frequently seen under Mesquite trees (PROSOPIS SP.) with the stems climbing the trunks and spreading through the branches.

Creamy-white blossom, normal size, *Ibervillea sonorae.*

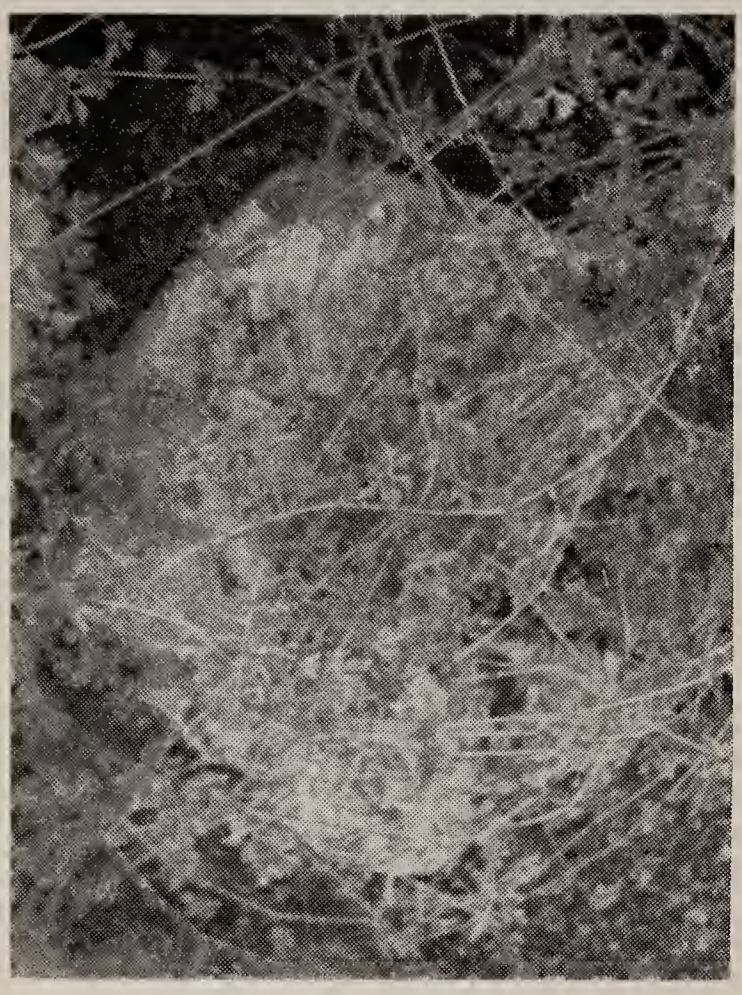
Normal-size leaf of *Ibervillea sonorae.*

UTILIZATION:

For landscaping purposes, IBERVILLEA would have little application. Collectors of unusual and rare plants may have an interest in it for the appearance of the globose stem section. It has been used on wire net to afford partial shade, but is in leaf too short a period to give real protection. The bright fruits attract birds and to achieve this end, it could be installed in a desert garden.

CULTURE:

A light, well-drained soil is required and water should be withheld during the winter dormant period. A trellis, fence, or tree is needed to provide a supporting structure on which the stems can ascenr. Light watering bimonthly during the dry period will suffice. A partial shade location will give best protection during hot dry summers.



Ibervillea sonorae tuber sitting on ground. 14″ in diameter, 4″ high.

PROPAGATION:

Propagation of IBERVILLEA is by means of seed. No pretreatment of the seed is necessary, it needs only to be extracted from the pulp. Growth rate is slow at first, bcoming more rapid when the caudex enlarges. Annual stem growth is rapid, but of short life. Fresh seed germinates rapidly and best results will be obtained by starting the seedlings in containers and transplanting them after one season's growth.

REMARKS:

Another species, IBERVILLEA TENUISECTA (Gray) Small, is found in southeastern Arizona, western Texas, and northern Mexico.

REFERENCES:

Gentry, H. S., Rio Mayo Plants.

Goldman, E. A., Biological Investigations in Mexico.

Kearney & Peebles, Arizona Flora.

HENRY R. MOCKEL, who, with his wife, operates the Pioneer Art Gallery, Twentynine Palms, Calif. Mr. Mockel is an outstanding artist and has captured the distinguishing characters of plants and their blossoms and has transferred them to greeting cards and notes.

Recently he has been commissioned to paint many of the desert plants for several outstanding Botanical Gardens.

Below he is pictured in the Garden doing detail work of a Saguaro Blossom.

THE GAY GARDENS

Ed and Betty Gay, 5353 Topeka Drive, Tarzana, Calif., recently bought a dwelling with a hillside back yard. This, Ed has tiered with wide beds fronted with attractive colored blocks.

Looking downhill, showing the many beds that will be planted according to cactus genera. This will soon become an outstanding morphological cactus garden. Note shading with Saran cloth.

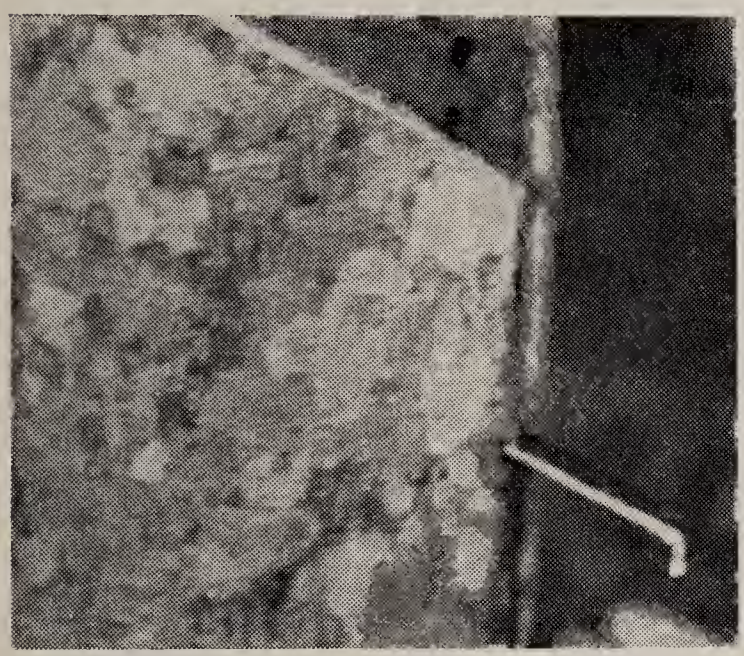
NATIONAL MONUMENTS IN ARIZONA

WALNUT CANYON NATIONAL MONUMENT, 4½ miles east of Flagstaff, holds over 300 small prehistoric cliff dwellings along the 400-foot-deep Walnut Canyon. Occupied from 1000 to 1200 A.D., it was a "prime residential site" with fertile soil, nearby water, and difficult access, which discouraged enemy raids. The exhibition building has displays which show much of the way of life of these prehistoric Indians.

FLORA & HORTICULTURE OF SINGAPORE

(Continued from last issue)

It was in the economic section of the Botanic Gardens, now the site of the University of Malaya, that the pioneer work on Para rubber and other economic plants was carried out. This led to the foundation of Malaya's rubber industry. For many years these Gardens were the sole source of planting material of many crops in Malaya, and seeds and plants were distributed from them to all parts of the tropics.



The study of the Malaysian flora is undertaken by the staff of the Botanic Gardens. A large herbarium of plants from Malaya and adjacent territories has been built up over many years and contains some 400,000 specimens. The collection is added to constantly by the staff themselves and by material acquired by exchange from other botanical institutions. So much new material and new knowledge has accumulated since the publication of Ridley's **Flora of the Malay Peninsula** in 1922-5, so that it is now out of date and a revised **Flora of Malaya** is being prepared. The first volume of the new **Flora**, namely **Orchids of Malaya** by R. E. Holttum, was published in 1953. In Ridley's **Flora** the orchids were described in less than 230 pages; the new volume has 750 pages and describes about 800 species of indigenous Malayan orchids, as well as many cultivated specoes and hybrids. The second volume on the **Ferns of Malaya** by the same author was published

A young (12 years) rubber plantation which is "cut" once a day. Inset shows the "cut" with latex dripping into a cup.

Strongylodon macrobotrys, "Jade Vine," imported from Madagascar.

in 1955 and this work is the result of some 30 years' research on this interesting group by Dr. Holttum, together with new ideas on their classification. In its 643 pages some 650 species of Malayan ferns are described. Both volumes are designed to be of use to the field naturalist and the gardener, as well as to the specialist. Two other works published by past members of the Gardens' staff which can be thoroughly recommended to the amateur interested in the plants of the country are Corner's **Wayside Trees of Malaya** (2nd edition, 1952) and Henderson's **Malayan Wild Flowers** (1951-4). Plants do not recognize political boundaries and research on the plants of Malaya involves the study of related plants from the Malaysian region as a whole. The **Flora Malesiana**, edited by Dr. van Steenis of Leiden and financed by the Indonesian Government, which is being published contemporaneously with our local Flora is therefore of considerable importance. Two volumes have been published to date and the staff of the Singapore Botanic Gardens is collaborating and will write accounts of certain families for it.

Technical papers dealing with the flora and related subjects are published in the **Gardens' Bulletin, Singapore.** Publication of revisions of groups of plants is a necessary preliminary to the publication of the **Revised Flora**, but such revisions are cast in a more detailed and more technical form than that suitable for a Flora, which must be designed to be intelligible to the laymen as well as to the professional. Critical study of the great amount of material collected in

Crientaztachys lakka, "Sealing-wax Palm."

the past 30 years or so by the Gardens and the Forest Departments of the Federation of Malaya and Borneo, which is necessary for these revisions, has revealed large numbers of undescribed species, as well as species of neighboring regions which have not yet been recorded from Malaya. So rich is the Malayan flora that undescribed species are still being found in hte small patches of florest on Bukit Timah and in the Botanic Gardens.

The cultivation and propagation of native and introduced plants of horticultural merit or economic interest is studied at the Botanic Gardens and every year many plants are introduced for trial. Gardening in Singapore is not easy. The soils are poor and the seasonless climate makes it difficult to find plants which will flower regularly and provide color in gardens. Methods of growing plants in beds and pots must be devised which will suit local conditions and these are very different from those in temperate countries or regions which enjoy a cold or dry season in the year. Nearly all the garden plants grown in Singapore have originated in countries other than Malaya, which has little to offer in this respect. It is, therefore, an essential function of the Botanic Gardens to introduce as many garden plants as possible, so that people can see what is available and what will suit their own gardens. One of the best methods of providing sufficien tcolor in the gardens is to use flowering shrubs, more especially those which will flower continuously or at short intervals. One such successful introduction has been the New Guinea creeper (**Mucuna bennettii**), which produces striking trusses of flame-colored flowers several times a year.

The breeding of new varieties of plants suitable for local cultivation offers great scope and has been actively pursued at the Botanic Gardens for many years. The program of breeding orchid hybrids, begun in 1929, has pro-

Homes on the Malay Peninsula, with tin or thatched roofs. Bananas, coconut palms and other fast-growing trees offer plenty of shade.

Cassia suraltensis, a free-blooming cassia, native of India

duced very successful and spectacular results. The aim of this work is twofold, namely, to produce new hybrids of horticultural merit and commercial worth and to investigate the relationship between the various groups of orchids. One cross made by a local enthusiast and raised at the Botanic Gardens produced **Vanda Tan Chay Yan,** which was awarded a First Class Certificate of the Royal Horticultural Society in 1954 and is considered to be one of the best Vanda hybrids bred anywhere in the world. Some 2,600 orchid crosses have now been made at the Gardens and every year new hybrids are coming into bloom. New crosses are continually being made, both in the Gardens and by local growers, a few of whom have mastered the technique of raising seedlings in flasks under sterile conditions. The principal genera used for crossing are **Arachnis, Dendrobium, Renanthera, Spathoglottis** and **Vanda.** A difficulty has been found in breeding new hybrids using **Aranda (Vanda x Arachnis),** but a few crosses are now being raised.

The cultivation of hybrid orchids is now very popular in Singapore and each year plants of higher quality are displayed at the annual Flower Show, both by amateur and professional growers, who have every reason to be proud of the high standards they have attained. Orchids grown in the Botanic Gardens were sent periodically to Malaya House in London for display in a window facing on to Trafalgar Square, and very favorable comments have been received on this exhibition. Orchid flowers from the Gardens have also been sent to the fortnightly shows of the Royal Horticultural Society in London, and to Karachi and Sydney.

Experiments in improving the culture medium and accelerating the growth of the orchid seedlings in the first stage in the flasks was continued, as was the work on the manuring of the young seedlings and the cultivation and propagation of the mature plants. The entire

Caesalpinia pulcherrima var. *aurea,* native of the West Indies.

orchid collection at the Gardens was moved from the Director's garden to a special orchid enclosure on Lawns P and R, which has a wire-mesh security fence with double barbed-wire apron. The latter is electrified to keep out the monkeys. The new site is proving better than the old one and there is now room for expansion.

The cultivation of cacti and other succulents is becoming increasing popular in Singapore. Some of the larger species grow and flower in the open in well-drained beds, while the smaller species are grown in pots as house decorations. The latter must be sheltered from the rain and given special treatment. Some 400 species of succulents have now been collected and are grown at the Botanic Gardens.

Singapore has a flourishing Gardening Society with some 250 members and its monthly meetings are well attended. At these meetings emphasis is placed on practical instruction. The Society holds its annual Flower Show in April and the standard of blooms and plants exhibited is high. The Malayan Nature Society has a Singapore branch, which arranges meetings and excursions. This Society and the Malayan Agri-Horticultural Society publish quarterly journals.

Fortnightly Sunday band concerts in the Botanic Gardens were resuscitated early in the year. They have proved very popular and are attended by large crowds.

Mr. H. N. Ridley, C.M.G., F.R.S., Director of the Botanic Gardens, 1888-1912, celebrated his hundredth birthday on the 10th December, 1955. Mr. Ridley will always be remembered for his pioneer role in the founding of Malaya's rubber industry and for his gargantuan contribution to our knowledge of the country's natural history. In honor of the occasion an exhibition was held at the Botanic Gardens, which were floodlit for a week and band concerts were held. The floodlighting achieved some very beautiful effects and was much appreciated.

A collection of Cacti that have a hard time growing in the tropics, as they acquire a coating of moss!

Plumeria acutifolia. Frangipani is found throughout Singapore, in colors of white, red, yellow and pink.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVIII October, 1964 No. 8

Gold Poppy—*Eschscholtzia mexicana*
See p. 89. Line drawing by Art Douglas

MAR 8 1965

REG MANNING

SAGUAROLAND BULLETIN

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W. HUBERT EARLE, Editor
LILLIAN DIVEN, Associate Editor

Volume XVIII | October, 1964 | No. 8

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Desert Botanical Garden of Arizona

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CAESALPINIA PLATYLOBA Wats. Fam. LEGUMINOSAE
PALO COLORADO

By John H. Weber, Horticulturist

DESCRIPTION:

CAESALPINIA PLATYLOBA is a small to medium tree or sometimes takes shrub form. It has an open and erect habit and is unarmed. The wood is hard and durable. Height ranges from two to eight meters, differing with form. Palo Colorado is winter deciduous, the leaves turning red in autumn before falling. Leaves are broad and pubescent and the leaflets are ovate-oblong to oval, measuring 2 to 5.5 cm. in length and 4 to 25 mm. in width. The yellow flowers are followed by long and pubescent pods. These are flat and thin and are from 6 to 13 cm. long and 1.5 to 4 cm. wide. There are several large seeds in each pod; these being flattened and brown in color.

DISTRIBUTION:

The type locality of Palo Colorado is Hacienda San Miguel in Chihuahua, Mexico. It extends west from Chihuahua into Sonora and Sinaloa states. It is also reported from San Luis Potosi and Oaxaca. In Sonora it is found at the following stations: Los Tanques, Mescales, Alamos, Navajoa, and Tesopaco.

Palo Colorado is scattered along streamways, on foothills, and in canyons. It commonly grows in association with CEIBA ACUMINATA in the short tree and thorn forests at elevations ranging from 250 to 800 meters. Soils are coarse and rocky.

UTILIZATION:

In warmer areas of the inland southwest and in the coastal areas of southern California, CAESALPINIA PLATYLOBA would be a desirable ornamental tree. The yellow flowers and large thin pods are attractive and the large leaflets that turn red in autumn and remain hanging for quite some time make it most useful in landscaping a desert garden. Being an unarmed plant, it can be used in patio areas or near areas of

Branch of *Caesalpinia platyloba* measuring sixteen inches wide.

4-year-old seedling tree of *Caesalpinia platyloba* 5′ 6″ tall.

heavy foot traffic. It is best used alone as an individual specimen plant.

CULTURE:

Palo Colorado has frozen to the ground at 17°F. on the grounds of the Desert Botanical Garden, but fully recovered the following spring, reaching a height of two meters in one season. It is drought deciduous, defoliating when subjected to prolonged absence of soil moisture. It should receive weekly irrigation in well-drained soils during dry seasons. Rapid growth under cultivation and occasional applications of fertilizer are needed.

PROPAGATION:

Seed coat impermeability exists in CAESALPINIA PLATYLOBA and must be overcome by scarification, hot water, or acid treatments. Germination and growth rates are rapid, a large tree being produced in four or five years. Seedlings are best started in small containers and planted out after a year's growth. Protection from freezing temperatures should be afforded seedlings and young plants.

REMARKS:

This plant is not known to us to be in cultivation, yet we feel it has merit for use in landscaping in the warmer desert sections.

REFERENCES:

Gentry, H. S., Rio Mayo Plants.

Shreve, Forrest, Vegetation of the Sonoran Desert.

Standley, P. C., Trees and Shrubs of Mexico.

Habitat of *Ferocactus wislizenii* along Pinal Pioneer Highway north of Tucson, Arizona.

ESCHSCHOLTZIA MEXICANA Greene Fam. PAPAVERACEAE
GOLD POPPY
CALIFORNIA POPPY

The California-poppy is an outstanding annual plant that will cover extensive areas during late February to late May with its solitary or sometimes clustered yellow-orange flowers when favorable conditions of extensive moisture and warmth prevail.

Its eye catching color will extend along well drained areas, preferably foothill slopes, throughout Arizona except its northeast area. Heavy concentrations are also found in the California Mohave desert and extending northeast into Utah.

Eschscholtzia mexicana resembles **E. californica** except for being a smaller plant and sometimes bearing white to pink flowers.

This genus was named for J. F. Eschscholtz, 1753-1831, a naturalist traveler on the Russian ship 'Ruick', who with Adebeck von Chamisso botanized in the San Francisco Bay area in 1815.

Cattle will browse these plants along with other wild flowers found on their range lands. Juice of the plant is mildly narcotic and it is reported to have been used by the California Indians to lessen toothache.

As is true of many of our southwestern wildflowers, this poppy is being used widely as an ornamental in our eastern states and other countries such as Australia and India.

REFERENCES:

Kearney & Peebles, Arizona Flora
Pepson, W. L., Flowering Plants of California
Jaeger, E. C., Desert Wild Flowers

Clustered plant of *Eschscholtzia mexicana*. These plants give a vivid color to our desert beginning in late February.

NATIONAL MONUMENTS IN ARIZONA

MONTEZUMA CASTLE NATIONAL MONUMENT in the Verde Valley, 5 miles north of Camp Verde, protects one of the best preserved and most dramatic Indian cliff dwellings in the country. Built into a great limestone cliff, the Castle served as home and fortress for nearly 200 Indians from the twelfth century until the beginning of the fifteenth century.

FEROCACTUS WISLIZENII (Engelm.) B.&R. Fam. CACTACEAE
FISHHOOK-BARREL, VISNAGA
BISNAGA, CANDY-BARREL

Field of *Ferocactus wislizenii* barrels each bearing different colored flowers. Photo—R. C. Proctor

The Fishhook-barrel is the largest of the Arizona cactus barrels, often attaining seven feet in height and two and a half feet in diameter. It prefers rocky hillsides or sloping grasslands from 1500' to 4500' elevations.

These large barrels differ in blooming habit from other Arizona barrels in that their yellow to red flowers appear in late July through August into early September. Their smooth fruit begins to ripen in December and January. To the casual motorist these crowns of compacted yellow fruits appear as yellow flowers in January through to March.

The fruits contain hundreds of black seeds which are eaten by birds, ground squirrels and rats. Occasionally the fruits are 'lifted-out' from amongst the spines by cautious deer and cattle for forage. Javelinas have been seen, during dry periods, gouging out a small hole on the side of the barrel through which they insert their narrow mouths and then eat a great portion of the inside of the barrel.

Legends arise that these barrels contain life-saving water for the parched desert travelers. Actually the cells of these plants contain a mucilaginous bitter juice that has a disagreeable taste to many persons. The barrel cactus growing at higher elevations do have a pleasant taste but within a few hundred feet can be found moisture or streams, so there is no need of destroying an aged barrel cactus for its questionable contents.

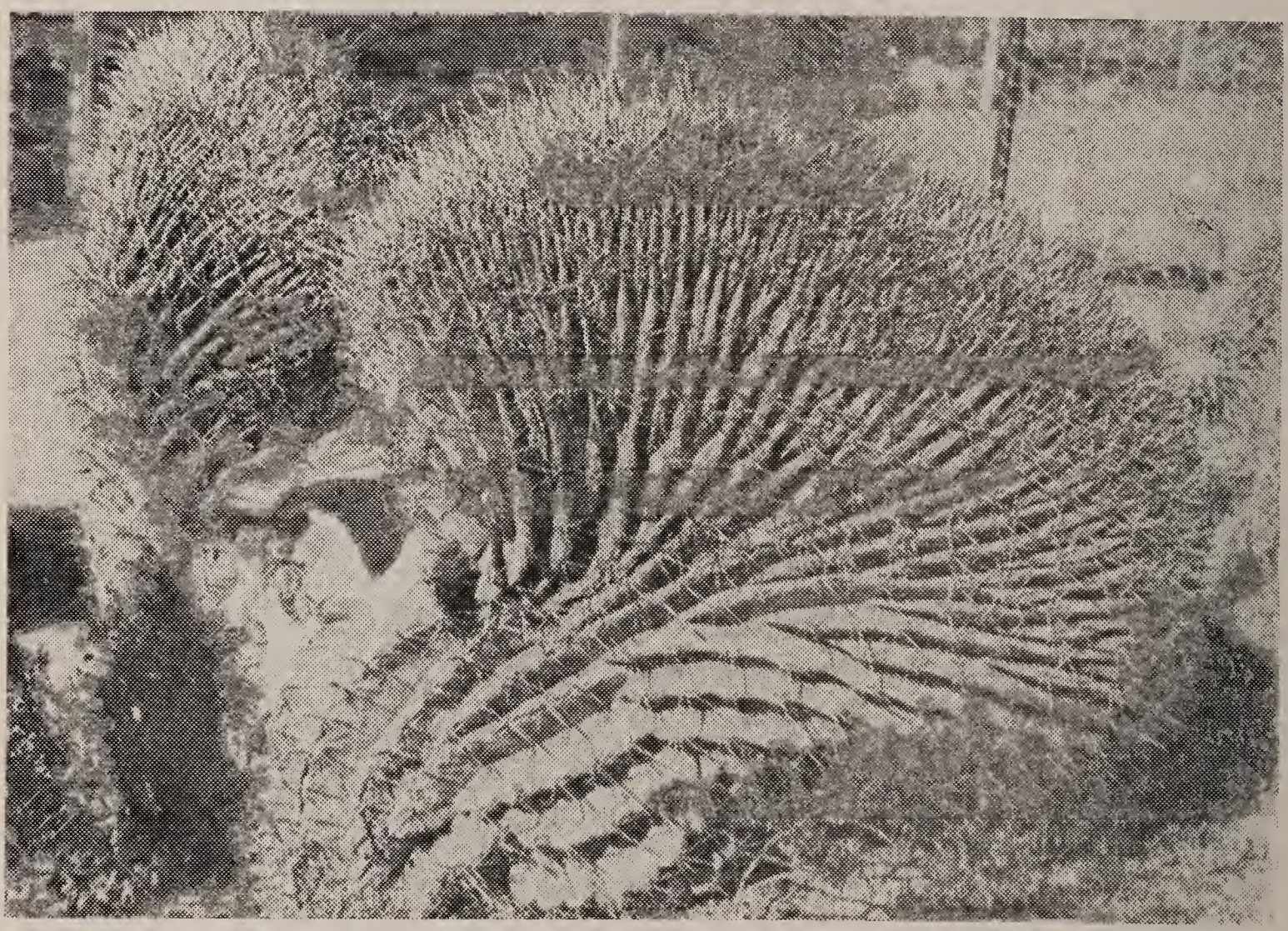
Barrel cactus can exist for many years without rainfall. Many have been seen that have fallen over yet continue to blossom and fruit for several years while lying on the ground. These fallen plants can be replanted but in doing so observe the slant of the plant's apex and reset it to the southwest.

The Indians for many years collected the seeds of these barrels and would grind them along with various other seeds, making a meal to be used in a pancake cooked on hot rocks. They also gathered these seeds and exchanged them for various commodities with the early settlers at Fort Lowell, north of the present city of Tucson, who would then feed the barrel seed to their poultry.

TYPE LOCALITY:
Donana, New Mexico
DISTRIBUTION:

Southwestern Texas, southern New Mexico, southern Arizona, northern Chihuahua, northern Sonora to the Gulf of California where they mingle with the northern limit of **Ferocactus herrerae.**

A young 20 year old *Ferocactus wislizenii* bearing smooth yellow fruits.

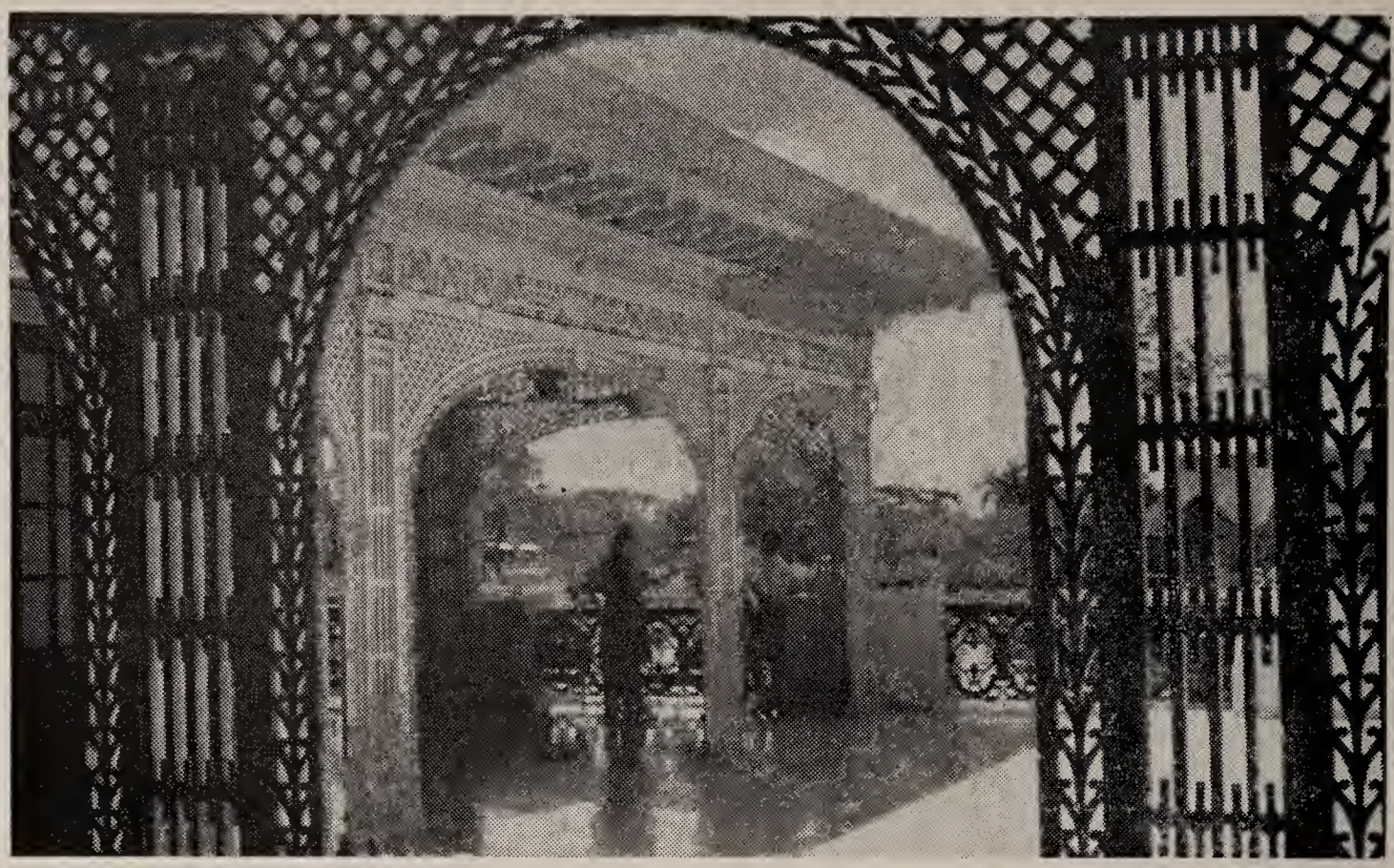


A crested *Ferocactus wislizenii* barrel given to the Garden by the late Emil Bien, Tucson, Aug. 1951, as a 2′ 2″ tall and 2′ 9″ wide plant. It is now 2′ 10″ tall with a double crest measuring 5′ 8″ in width.

PACIFIC ON PARADE: MANILA BOTANICAL GARDEN

Mrs. Earle and guide at the entrance to the Manila Zoological and Botanical Garden. The 25c entrance fee was waived that day because it was the Philippine Independence Day.

Inside courtyard of St. Augustine Church which is over 350 years old. It is within the Walled City built in 1571.



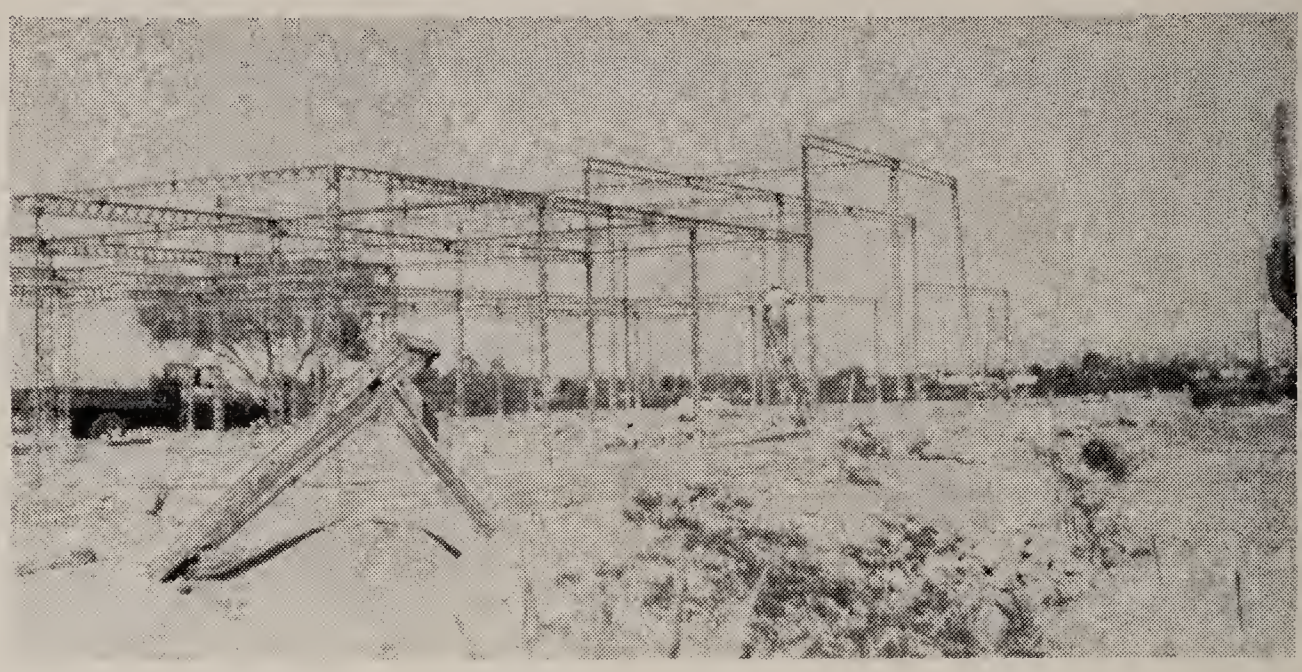
Portion of Malacanang Palace's open balcony dining room overlooking river which separates the golf course from the palace.

Hylocereus undulatus climbing 45′ tall trees on the grounds of Malacanang Palace, the official residence of the President.

Santo Tomas University, one of the world's oldest, founded in 1611. It has outstanding collections of birds, animals, stamps and coins.

Santo Tomas Greenhouse and Botanical Garden, adjacent to the University, growing mostly Philippine native plants.

GARDEN BUILDING PROGRESS



John Weber and William Hendrix have, during the past month, been erecting the steel uprights and girders for our new 50′ x 100′ lathhouse.

Steel uprights and girders are now in place, with aluminum lath added for shading. Rock walls for elevated beds will be built at front and east of the lathhouse.

GARDEN ACTIVITIES FOR OCTOBER

Tues. Oct. 6th, 8:00 P.M.—Cactomaniacs

Wed., Oct. 7th, 12:00 Noon—Address North Phoenix Lions Club

Fri., Oct. 9th, 1:30 P.M.—Conduct class for Maricopa County Parks Rangers

Tues., Oct. 20th, 1:30 P.M.—Address P. E. O. Club, Mesa

Wed., Oct. 21st, 7:30 P.M.—Address Sunrise Optimist Club.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVIII November, 1964 No. 9

Penstemon pseudospectabilis

(See page 101)

REG MANNING

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Desert Botanical Garden of Arizona

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GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

CEIBA ACUMINATA (Wats.) ROSE Fam. BOMBACACEAE
POCHOTE
KAPOK

By John H. Weber, Horticulturist

DESCRIPTION:

CEIBA ACUMINATA, in form, is a large tree with wide spreading branches. It attains a maximum height of about 15 meters, but in the northern limits of its distribution it seldom exceeds 8 meters. The crown is open with only a few branches which are unarmed when young. The tapering trunk is green to light gray and armed with broad conical thorns. Leaves are palmate, the leaflets usually number seven. Leaflets are thin, 7 to 15 cm. long, and elliptic to oblanceolate in shape. Leaflet margin is serrate. The Kapok tree is drought deciduous and frequently is bare most of the year. Flowering occurs in June. Petals are 10 to 14 cm. long and covered on the outside with yellow hair. Calyx is 3 to 4 cm. long. The peduncle bears only a single flower. The seed pod is a large, woody, 5 celled capsule. It measures from 15 to 18 cm. long and is filled with white silky fibers known commercially as kapok. The capsule is dehiscent releasing the fibers and seed. Seeds are small and become wind-borne with the attached fiber awns.

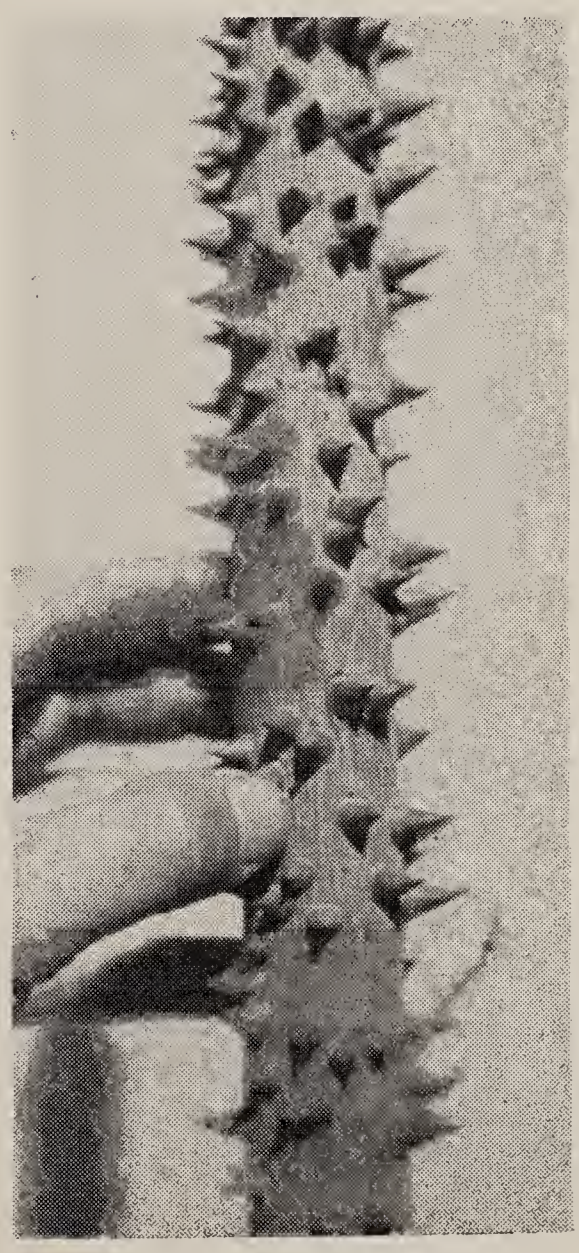
DISTRIBUTION:

Pochote or Kapok is found in Chihuahua, Sonora, and the Baja California peninsula of Mexico. It is reported to grow also in Tamaulipas and Zacatecas Mexico. The type locality is Hacienda San Miguel, Chihuahua and it extends through the southern part of the Sonoran desert.

Ceiba occupies a varied habitat, growing on the open plains as well as on hill slopes and in canyons. Elevational range extends from 250 to 1,000 meters. It is in common association in the short tree and thorn forests with LYSILOMA Sp., CERCIDIUM SONORAE, ACACIA CYMBISPINA, and JATROPHA Sp.

UTILIZATION:

CEIBA ACUMINATA is limited in its application in landscaping in the southwestern United States. It is tender and repeated freezing temperatures cause extensive crown damage. The long period of being deciduous is another feature rendering it undesirable as an ornamental plant. The very large conical thorns on the trunk and main branches give it a unique appearance and it would present an unusual aspect in the desert garden. It is used primarily as an individual specimen or accent tree.



1¼" trunk of *Ceiba acuminata* with conical thorns.

CULTURE:

Kapok is a drought resistant plant, but regular irrigation is needed to maintain it in foliage during warm months. In cultivation, CEIBA is moderate in growth, but protection should be afforded young trees to prevent freezing back. A well-drained soil on a protected site is preferred. Top mulching would reduce water loss and if manure is used, it would provide a light fertilization.

PROPAGATION:

Pretreatment of seed is unnecessary and while germination is rapid, seedling growth rate is at best only moderate. Seedlings are best grown in containers for two years and then planted out. Seed of the Kapok seems to be of short term viability and should be utilized without long delay. Small seedlings of this species are particularly susceptible to damp-off.

REMARKS:

Not only is the fiber useful to Man, but the seeds are edible and have a nut-like flavor.

REFERENCES:

Gentry, H. S., Rio Mayo Plants.

Shreve, Forrest, Vegetation of the Sonora Desert.

Standley, P. C., Trees and Shrubs of Mexico.

3 year old *Ceiba acuminata* seedling 60″ tall.

Ceiba acuminata leaf cluster 13″ wide.

PENSTEMON PARRYI SCROPULARIACEAE
BEARDTONGUE (Figwort family)

The Penstemons are a large family having thirty-eight species in Arizona and several varieties. They are perennial herbs with bright to shiny green foliage, bearing opposite leaves, and are found throughout the state, blossoming from early spring to late summer with showy flowers on tall stalks.

Penstemon is the usual usage of the genus, but it was originally spelled Pentstemon with an additional 't'. The word means 'fifth stamen,' for the fifth sterile filament which, bearing a brush of yellow hairs, gives the plants the common name 'Beardtongue'.

30″ tall volunteer *Penstemon parryi* plants. To the right is shown a typical flower stalk and leaf arrangement.

Penstemon parryi was introduced to the Garden in 1953 from seed gathered south of Oak Creek, Ariz., elevation of about 4500'. It took several years before the plants adapted themselves to the lower desert of 1200' but they now reseed themselves throughout the Garden and give a nice show of color from early March until summer. Their 3'-4' tall flowering stems of rose-magenta flowers are quite colorful and will last into the hot summer with additional twice-a-week waterings.

Many gardeners in and near Phoenix are now growing this species from seeds off the Garden stock and report great success.

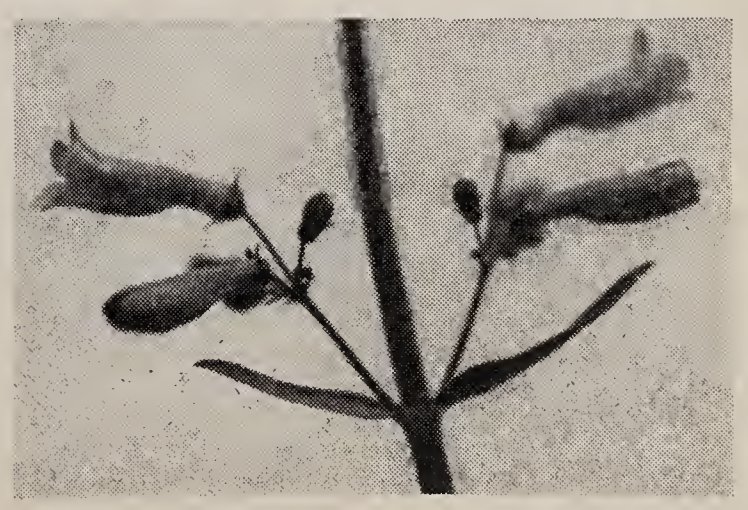
An unusual species **Penstemon microphyllus**, a large shrub browsed by cattle, and with large clustered yellow blossoms, was found amongst Junipers northeast of Cavecreek several years ago but as yet no seed germination has been successful. This shrub is summer-deciduous and thus not attractive for home use. Possibly stem cuttings at a certain time of the year might prove profitable.

Penstemon barbatus, P. eatonii, P. palmeri, P. pseudospectablis and others have been tried in the Garden with but little response to our hot summers and low humidity.

REFERENCES:

Arizona Flora—Kearney & Peebles.

Desert Wildflowers — Edmund C. Jaeger.



Wupatki Indian Ruins

FEROCACTUS COVILLEI — CACTACEAE

NAILKEG-BARREL, COVILLE'S BARREL

This is one of Arizona's most outstanding barrels but not often seen in its native habitat due to its inaccessible range. It is a solitary, clean-appearing plant 2'-4' high but sometimes taller and 12" to 20" in diameter. Its somewhat tubercled ribs are covered with 1½"-2½" radial spines that recurve around the plant and one 2"-5" hooked central spine extending at right angles to the plant. The arrangement of these spines makes this barrel formidable to rodents and other plant-eating animals.

Large 3"-diameter, deep mahogany red flowers (in some plants copper to yellow), appear on the apex of the plant in early August. The petals all have a mid-rib darker than the margins. These flowers are followed by yellow semi-dry fruit bearing outer scales and containing many black seeds which are eaten by birds and rodents.

F. covillei is found in southern Arizona from western Pima County west to Organ Pipe Cactus National Monument, and the south side of the Sierra Estrella Mountains south into northern Sonora, Mexico at elevations of 1500'-3000' on the lower foothills and in the alluvial soil of the valley floors.

A comparison of the three Ferocactus barrels in Arizona showing their various spine clusters. These 12-14 year old plants are *Ferocactus covillei* to the left and above photo, *F. wislizenii* upper right and *F. acanthodes* lower right.

Koko Head Crater is the youngest crater (formed about 10,000 years ago) on the island of Oahu within a few miles of Honolulu. It has only 16″-20″ of annual rainfall and within its caldera will be built the Lyon Botanical Garden. At the arrow's point, in above photo, the lower photo was made, showing the steep sides and the mesquite trees crowding the bottom of the volcano. The Agaves are part of a planting program of the Friends of the Foster Garden spearheaded by Mac Wills an energetic 'resident'.

PACIFIC ON PARADE: HAWAII

PRESENT STATUS OF BOTANIC GARDENS IN HAWAII

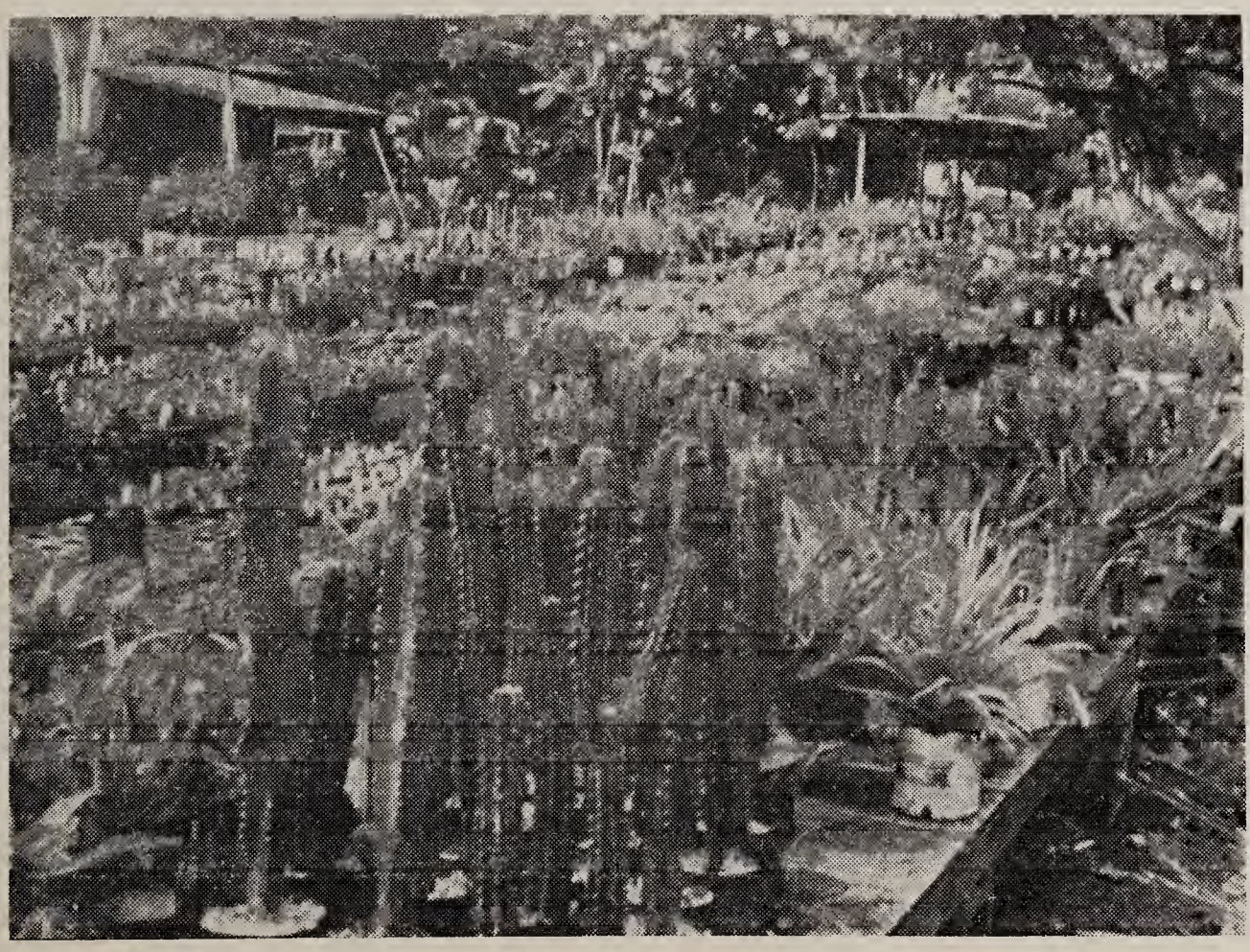
(A paper delivered to the Tenth Pacific Science Congress, Honolulu, Hawaii, September 2, 1961, by P. R. Weissich, Director, Division of Botanical Gardens, Honolulu, Hawaii)

L. H. Bailey has defined a botanic garden as "a collection of growing plants, the primary purpose of which is the advancement and diffusion of botanical knowledge". In practice the definition further includes the presence of a library, an herbarium, laboratories, publications and a scientific research and teaching staff. The latter are the means of advancing and diffusing botanical knowledge.

In order to indicate the status of the Foster Botanical Garden it is necessary to sketch its history.

One hundred and ten years ago William Hillebrand, known to you for his "Flora of the Hawaiian Islands," acquired two acres of land at the mouth of Nuuanu Valley. There he built his home and surrounded it with trees brought by him to Hawaii from the Asiatic and American tropics. The largest trees to be seen at Foster Garden today were planted by Hillebrand. The Foster family later purchased the site from Hillebrand and added more acreage and plantings. In 1930 upon the death of Mary Foster the property was bequeathed to the people of Honolulu under the jurisdiction of the City and County of Honolulu.

In January of the current year (1961) the City and County of Honolulu embarked on a formal botanical program establishing within its auspices the Division of Botanical Gardens. For better or worse the speaker was appointed Director and the new program was launched.



A portion of the Gardens Dept. propagation yards showing the many succulent plants being grown for future landscaping purposes.

Honolulu has been generous to the new baby. Land-wise the garden has grown rapidly. Land is expensive in Hawaii — far more costly than buildings— and difficult to obtain where and when you want it. The new Botanic Garden Division has jurisdiction over 450 acres of land valued approximately at twenty million dollars. Of this area the City presented this year, since July 1, nine new acres adjacent to Foster Botanical Garden, thereby doubling its size, and I am pleased to announce that as of this week the Division includes a 50 acre beach site for the development of a tropical strand collection.

To dispel confusion relative to the various sites within the control of the Botanic Gardens Division I would like to list the following existing areas:

1. Foster Botanical Garden: 18 acres, at 40' elevation, 40" annual precipitation;
2. Wahiawa Botanical Garden: 27 acres, 1000' elevation, 80" rainfall;
3. Lyon Botanical Garden: 350 acres, 100'-500' elevation, 20" annual rainfall;
4. Kapiolani Hibiscus Garden: 2 acres, sea level, 20" annual rainfall;
5. Walumalu Beach Botanic Garden: 50 acres, sea level, 20" rainfall;
6. Kapiolani Nursery: 4 acres, sea level, 20" rainfall.

Insidious plans are now afoot to add a very sizeable acreage extending to 2000' elevation with high rainfall. This area will complete the major ecological settings for a complete tropical planting program.

Of the existing sites only Foster Botanical Garden is at all developed. Its status is semi-botanical. An excellent start has been made on Bailey's requirement of "collections of living plants". Additions to the present collections are being made through an active import and exchange program which introduces approximately 1000 new plants to Hawaii annually. A special effort is be-

White Orchid Tree—*Bauhinia variegata var. candida* (Linn) is one of about eight fascinating species found in the Foster Gardens and is a native of India.

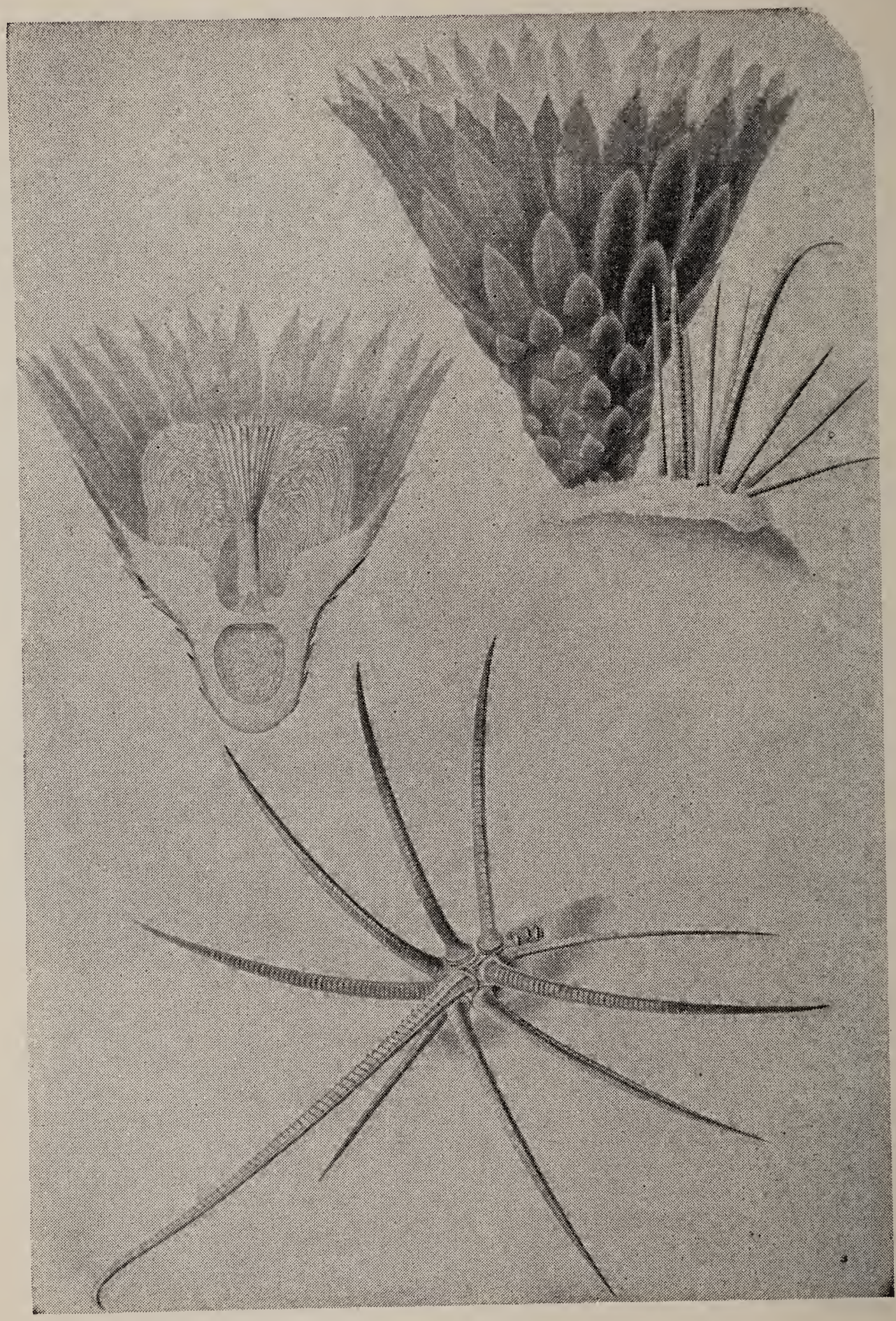
ing made to determine successful methods of growing the endemic flora including those from high elevations. Most of the surviving species of Pritchardia, for example, are being grown at Foster Garden. Similar trials are being made, with varying degrees of success, with the endemic Hibiscus, Gardenias, Pleomeles, Pittosporum and others. The major research of the Division of Botanical Gardens will be directed toward the endemic flora in both a scientific and popular vein. At least one portion of the flora may be saved from a final resting place in an herbarium if ways can be discovered to grow them under garden conditions. Education in this area may well lead to conservation measures. As the Bishop Museum preserves the feather cloaks and artifacts of a society destroyed by modern man so may Foster Garden preserve living specimens of a flora being similarly destroyed.

Of the other garden sités the Lyon Botanical Garden within the caldera of Koko Crater will contain a dryland flora, the Walumalu Beach garden will present a tropical strand collection, the Wahiawa and the not-yet-acquired site will contain grades of the cool upland floras. The Kapiolani site is planted to the genus Hibiscus.

An additional and quite unique aspect of the new Botanical Gardens Division involves a serious and much needed beautification project. The Division is responsible for designing, executing and maintaining an Island-wide tree planting program which involves several hundred miles of Oahu streets and roads. The influence and opportunity thus afforded cannot be underestimated.

Foster Botanical Garden will remain the nucleus garden in which administration and planning will be centered for a chain of gardens. In its first phase the Division will stress public education and display. In its second phase a "Bailey-defined" botanical garden will emerge and Hawaii will have a tropical botanical garden.

Coral Hibiscus, *Hibiscus schizopetalus* (Mast) is a small 4″ reddish hibiscus with a graceful appearance, having lacy petals and a drooping staminal column that sways in the lightest breeze. It is a native of East Africa and has been used extensively in the Gardens as a cross with other species.



Ferocactus covillei B.&R. A plate from the U. S. Mexican Boundary Survey 1859. Descriptions and photos found on page 103 of this issue.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVIII December, 1964 No. 10

PRICKLEPOPPY — *Argemone platyceras*. See p. 113. Line drawing—Art Douglas

REG MANNING

SAGUAROLAND BULLETIN

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W. HUBERT EARLE, Editor
Lillian Diven, Associate Editor

Volume XVIII | December, 1964 | No. 10

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GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

GUAIACUM COULTERI A. Gray Fam. ZYGOPHYLLACEAE
GUAYACAN
PALO SANTO

By John H. Weber, Horticulturist

DESCRIPTION:

GUAIACUM COULTERI grows as a large closely-branched shrub or small tree ranging in height from 3 to 7 meters. There is a complex branching habit of unarmed and crooked stems. The resinous wood is hard and is brown to black in color. Guayacan is drought deciduous, the thick leathery leaflets falling when the plant is under stress. Leaves are opposite and bear from 6 to 10 leaflets. These leaflets are entire on the margins and measure 1 to 2.5 cm. in length. Flowers are in profusion beginning in May and continuing through the early summer months. These flowers are large and fragrant, and the petals are bright blue shading to violet. The petals number 4 to 5 and are 1 to 1.5 cm. long; stamens number 8 to 10. Capsules are three or four angled and 1.5 cm. in length. Seed is yellow to white in color and about 11 mm. in length.

DISTRIBUTION:

Guayacan is in common association with FOUQUIERIA MACDOUGALII, CERCIDIUM SONORAE, and JACQUINIA PUNGENS. It is found at elevations ranging from 150 to 600 meters on sandy or rocky soils. Habitat is limited to the coastal plains and southern foothills region on arid hillsides of the thorn and short tree forests.

The type locality is near Ures, Sonora, north and west of Hermosillo. It is common along the highway from Hermosillo to Guaymas and attracts much attention from tourists when in flower. It is seen also at Alamos, Tesopaco, Los

Guaiacum coulteri trees 15′ tall and 12′ wide growing along highway half way between Hermosillo and Guaymas, Sonora.

Tanques, San Bernardo, and near Navajoa.

UTILIZATION:

The primary value of GUAIACUM COULTERI in the desert landscape is for a flowering tree. The blaze of bright blue flowers, coming at a time when most spring flowering is finished, has to be seen to be believed. Being of dense habit, it could also be used for screening purposes. Slow growth rate is a limiting factor in the utilization of this species.

CULTURE:

Guayacan requires a full sun exposure and adequate space to expand in without crowding. This species is drought resistant, but to achieve continuous annual growth supplemental water should be provided when there is no summer precipitation. Soil should be rocky or well-drained.

PROPAGATION:

Seed has been germinated at the Garden without pretreatment, but soaking in hot water releases the heavy envelope covering the seed and reduces loss after emergence of the plumule. Germination rate and percentage is low. Growth rate also is slow, a plant of only 15 cm. (6 in.) resulting from two years growth. Propagation by cuttings may prove more rapid and effective, but it has not been attempted at the Garden for a lack of cutting wood.

REMARKS:

No other Sonoran plant has brought more inquiries from visitors returning from Mexico than GUAIACUM. Once seen in flower, it is never forgotten.

REFERENCES:

Gentry, H. S.—Rio Mayo Plants.

Goldman, A. E.—Biological Investigations in Mexico.

Shreve, Forrest—Vegetation of the Sonoran Desert.

Standley, P. C.—Trees and Shrubs of Mexico.

9″ tall, 3 year old seedling of *Guaiacum coulteri*

Seed capsule of *Guaiacum coulteri* and seeds removed from capsule.

Top to bottom:

Seed capsule of *Guaiacum coulteri*

Seed after removal from capsule.

Seed has been soaked in water, revealing a white membranous coating.

Seed with swollen coating removed for planting.

ARGEMONE PLATYCERAS

PAPAVERACEAE
POPPY Family

PRICKLEPOPPY
CHICALOTE

The perennial, coarse pricklepoppy plant can be easily identified, as its stems, leaves, flower buds and seed capsules are covered with many short prickles. The plant is erect, one to three feet tall, with a silvery coating over its leaves and stems. The plant will die back in late summer but then begins to sprout again in November, and, in our low deserts, begins in December to bear large white blossoms that have numerous orange-colored stamens. It is humorously referred to as the 'fried-egg' plant.

The large blossoms with four to six white or pale yellow petals resemble those of the Matilija poppy (**Romneya**) of the southern California coast except that the latter has smooth stems and leaves.

The plants grow along highways, ditches and very dry fields and are quite drought-resistant. Plants found near Tucson that bear yellow petals are **Argemone mexicana** and were possibly introduced to that area.

All pricklepoppies are unpalatable to livestock due to the abundance of prickles and the acrid juices in the leaves and stems. They range from the east side of the Sierra Nevada mountains in southern California eastward to Texas and grow in the mountain valleys or canyon flats from one to eight thousand feet elevation. In the higher areas they bloom only from April to September. It is said the seeds of **Argemone** are much more of a narcotic than those of opium.

REFERENCES:
Arizona Flora—Kearney & Peebles.
Desert Wild Flowers—Edmund C. Jaeger.

NATIONAL PARKS IN ARIZONA

PETRIFIED FOREST NATIONAL PARK is located 18 miles east of Holbrook in one of the most colorful sections of the Painted Desert. Its 94,161 acres contain the largest and most brilliant display of petrified wood in the world. There are six "forests" of agate and jasper logs up to 100 feet in length, and about 180 million years old. Animal fossils have also been found in the Park, as well as Indian petroglyphs.

ECHINOCACTUS POLYCEPHALUS

CACTACEAE
CACTUS Family

WOOLLY-HEADED BARREL

As a solitary plant it blends in with its hot desert surroundings but when it begins to make numerous heads (stems) it will eventually become about two feet high and about four feet in diameter and becomes quite conspicuous in the arid desert which can be either clay valleys or lava flows draining into the Colorado River.

The mound arises from one main root but each stem offsets from another stem. The stems are covered with stiff gray to reddish, slightly curved and flattened, central and radial spines. The stems can be five to twenty-four inches tall and four to ten inches in diameter.

Small yellow blossoms appear on most of the plants in early May and are followed by yellow, dry, globose fruits which are also covered with dense wool. Rodents and birds remove the fruits from amongst the dense spines and dig or pick out the small black seeds.

Many areas that had these mounds of woolly–headed barrels have been cleared out by unethical collectors, but those plants in Sonora, Mexico are safe as collectors cannot bring into the United States any plant over twelve inches in height unless by a special permit.

TYPE LOCALITY:

Along Mojave River, Calif.

DISTRIBUTION:

Nevada, Utah, western Arizona, southern California and northern Sonora.

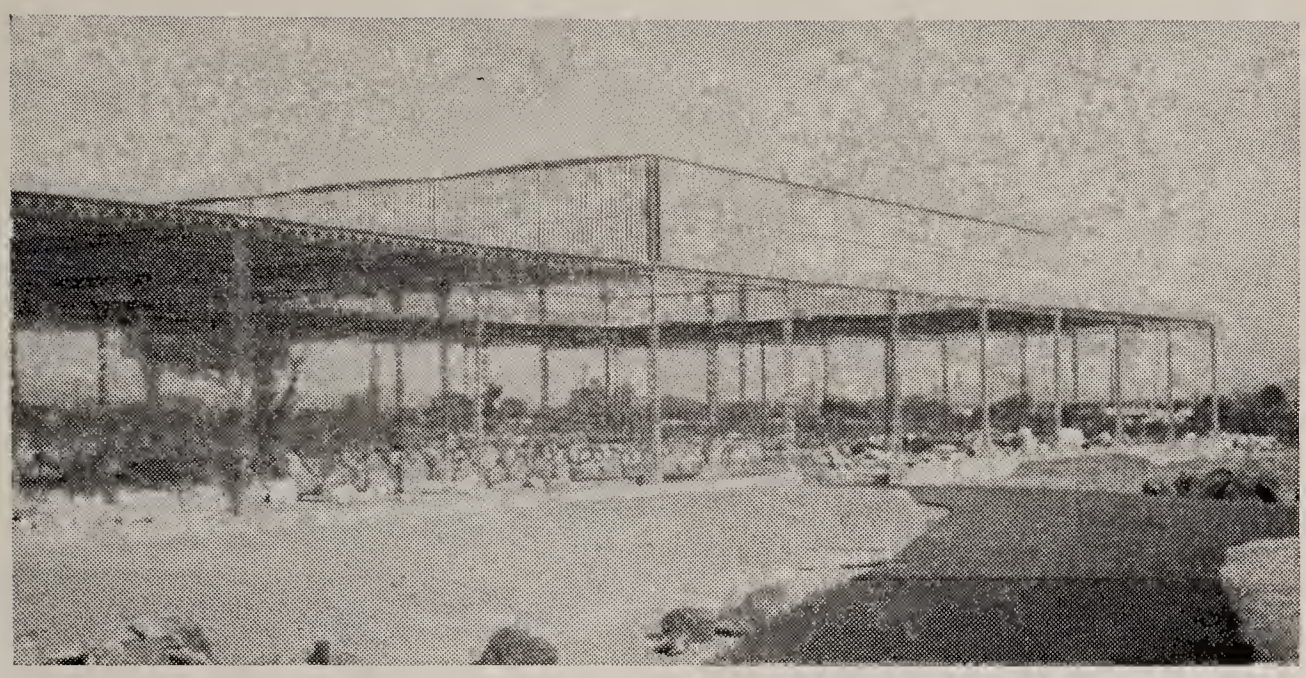
18″ wide clustered *Echinocactus polycephalus,* Yuma, Arizona. Displayed at cactus show by C. C. Pidgeon.

Echinocactus polycephalus var. xeranthemoides. 4′ wide clustered plant that grows near Cameron, Arizona.

GARDEN'S IMPROVEMENT & BUILDING PROGRESS

During 1964 the two major projects in the Garden were the resurfacing of a large portion of the "Nature Walk" and erecting our second steel-aluminum lathhouse. The top photo, looking toward Auditorium, clearly indicates how the newly-covered paths enhance the clean appearance of the Garden.

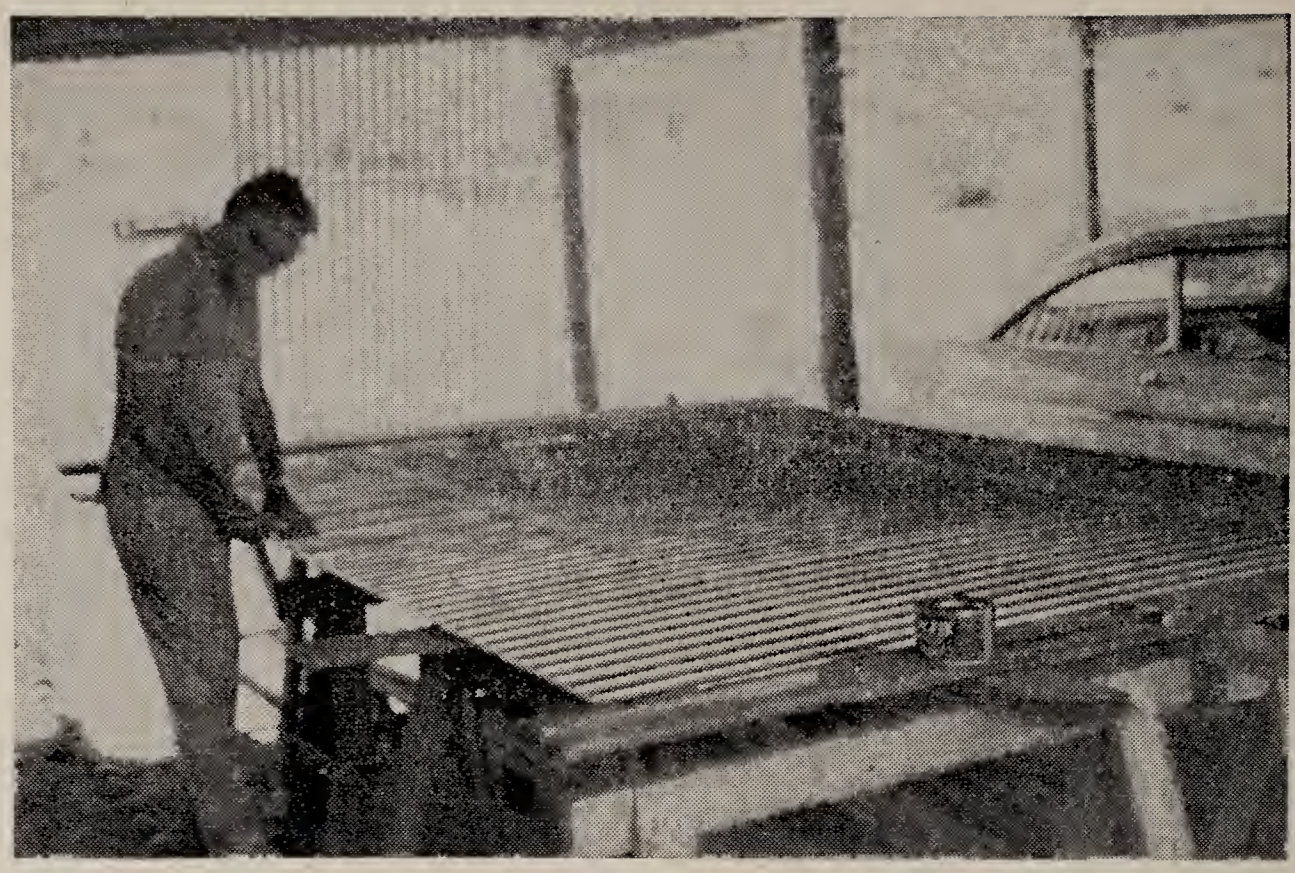
1640 square yards of hot asphalt were spread by a contractor, as shown in lower photo. We gave him some help, as in the background can be seen staff member Wm. Hendrix operating our tractor in crowded quarters. These paths will now be easy to clean and comfortable underfoot for our many visitors.



The asphalt paths have been carried to and through the above new lathhouse and they all have good fast drainage.

A contractor put in the foundation walls and piers. Our staff, supervised by John Weber, erected all the steel and attached the aluminum panels. The building was bought in 1963 at a receivers' sale and we redesigned it to increase its size to 5000 sq. ft.

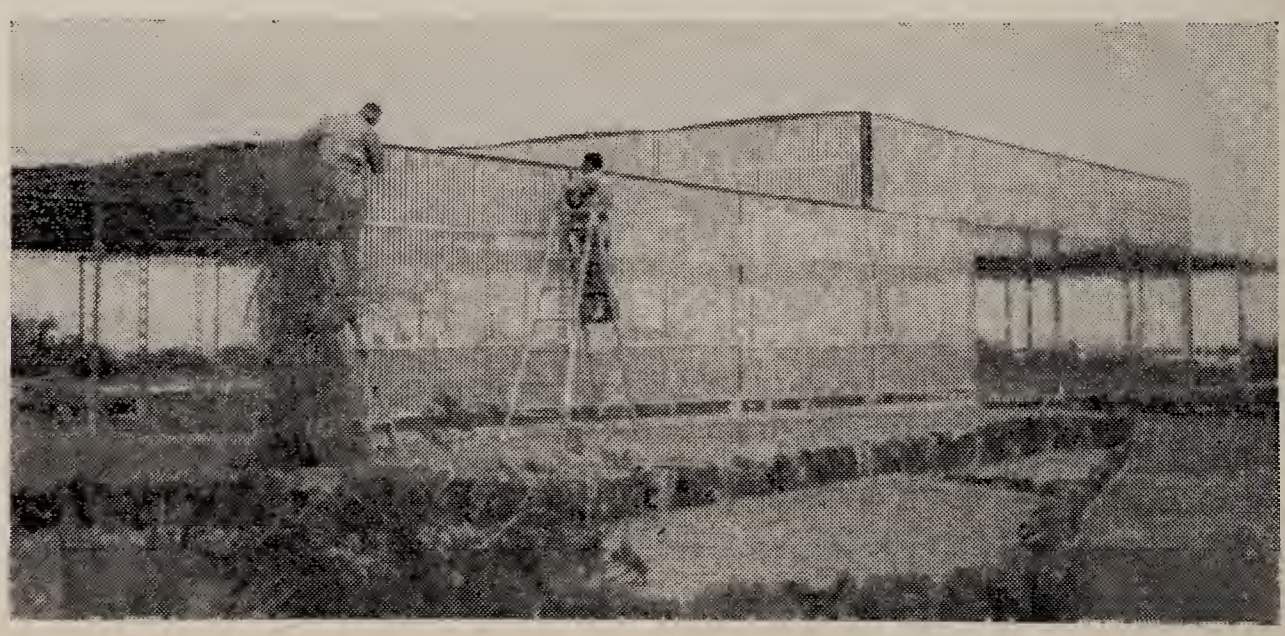
Below can be seen a portion of its interior showing the white limestone walls erected by Roy Bell, seen stooping over his work, who is an excellent stonemason and found the time from his regular work to help us on weekends. This is indeed another beauty spot in the Garden.



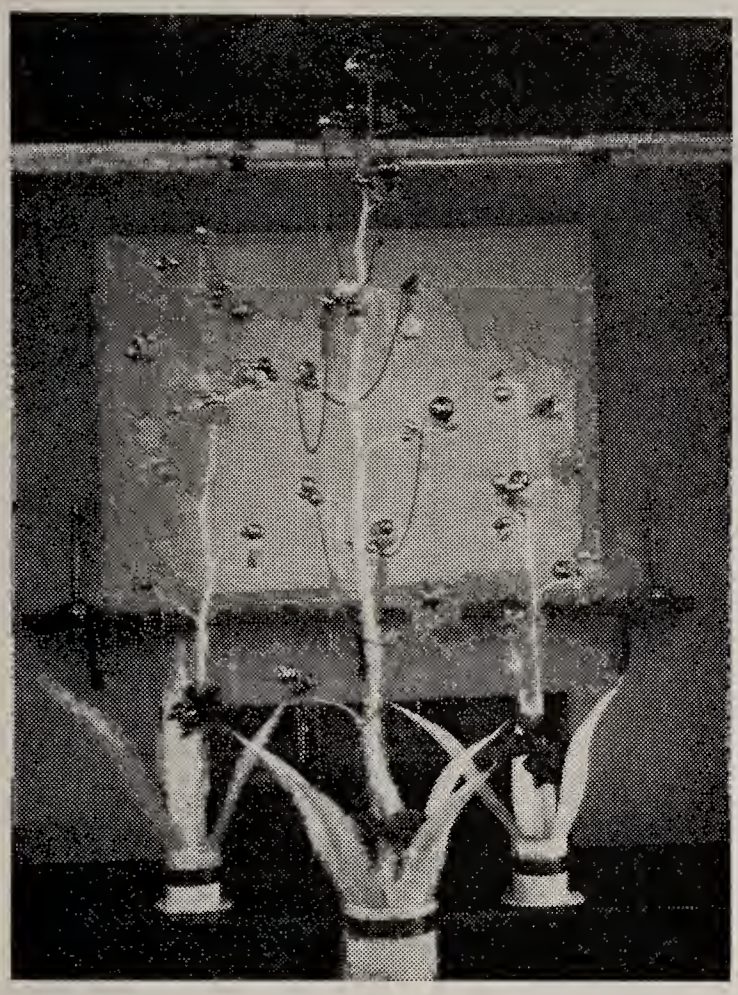
During the heat of last summer, Roy Jones, shown above, assembled and respaced 95 top and side panels, which were then stored until late fall, when they were attached to the steel uprights by staff members Wm. Hendrix and John Weber as shown in lower photo.

Our students Wm. Halvorson, Terry Truesdell, John Mieg and Jon Grange are to be given a lot of credit for hard work in building the outside beds with heavy black volcanic rock.

We plan on having the lathhouse dedicated and opened during the Cactus and Succulent Society Convention in May, 1965.



AGAVES FOR CHRISTMAS



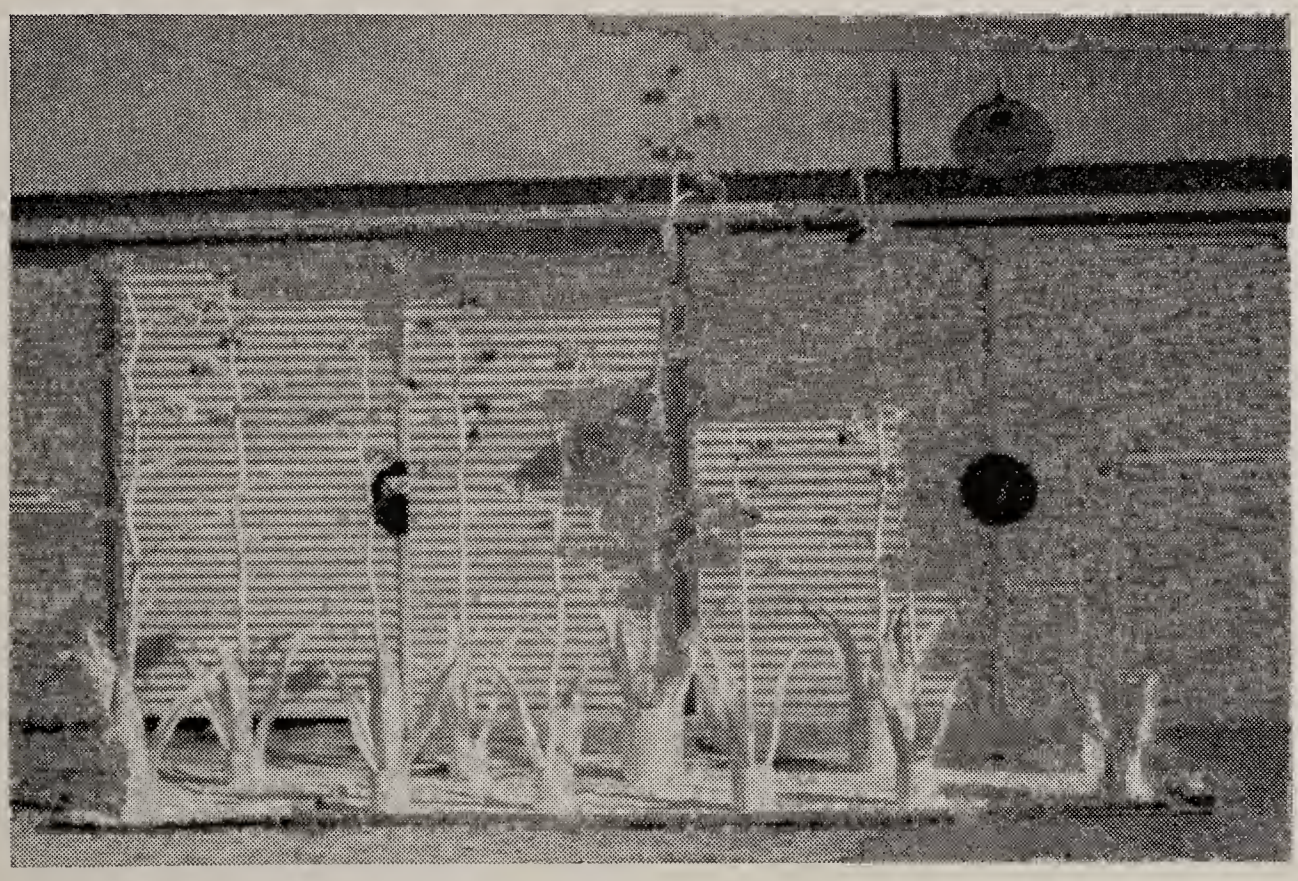
Decorated 'trees' in the auditorium.

Each year our Garden attempts, through the efforts of Mrs. Lois Earle, wife of your editor, to have a different type of Christmas "tree" display for our holiday visitors.

This year Mrs. Earle created a "tree" using the dead flowering stalk of **Agave palmeri var chrysantha** found in abundance along the highway hillsides outside Superior, Arizona.

The stalks, plus leaves of **Agave americana,** were placed in large tin cans to which was added Portland cement for support and weight. The stalks were then sprayed with white paint.

A feature newspaper story and photos by Mary Leonhart of the **Arizona Republic** caused many local persons to make similar "trees" and place them at door entrances, studio windows and beside mobile homes.



Eleven century plant 'Christmas Trees' 5′-10′ tall ready to be decorated and to be placed around the different Garden buildings.

GARDEN ACTIVITIES

NOVEMBER

Tues.	3rd	CACTOMANIACS meeting	8 P.M.
Wed.	4th	CLASS—Deserts, how formed and their plants	3 P.M.
Thurs.	5th	LECTURE—Arizona Cacti in Flower	3 P.M.
Sun.	8th	LECTURES—Arizona Cacti in Flower	3 & 4
Wed.	11th	CLASS—Desert Succulent Plants	3 P.M.
Thurs.	12th	LECTURE—Arizona Wildflowers	3 P.M.
Sun.	15th	LECTURES—Arizona Wildflowers	3 & 4
Wed.	18th	CLASS—Culture of Succulent Plants	3 P.M.
Thurs.	19th	LECTURE—Arizona Trees & Shrubs in Flower	3 P.M.
Sun.	22nd	LECTURES—Arizona Trees & Shrubs in Flower	3 & 4
Wed.	25th	CLASS—Identification of Trees & Shrubs	3 P.M.
Thurs.	26th	LECTURE—Arizona Birds & Animals	3 P.M.
Sun.	29th	LECTURES—Arizona Birds & Animals	3 & 4

DECEMBER

Tues.	1st	CACTOMANIACS Meeting	8 P.M.
Wed.	2nd	CLASS—Culture of Desert Trees & Shrubs	3 P.M.
Thurs.	3rd	LECTURE—Arizona Scenics	3 P.M.
Sun.	6th	LECTURES—Arizona Scenics	3 & 4
Wed.	9th	CLASS—All-day Desert Field Trip	9 A.M.
Thurs.	10th	LECTURE—Leaf Succulent Plants	3 P.M.
Sun.	13th	LECTURES—Leaf Succulent Plants	3 & 4
Thurs.	17th	LECTURE—Collecting Plants in Mexico	3 P.M.
Sun.	20th	LECTURES—Collecting Plants in Mexico	3 & 4
Thurs.	24th	LECTURE—Arizona Cacti in Flower	3 P.M.
Sun.	27th	LECTURES—Arizona Cacti in Flower	3 & 4
Thurs.	31st	LECTURE—Arizona Wildflowers	3 P.M.

JANUARY

Sun.	3rd	LECTURES—Arizona Cacti in Flower	3 & 4
Tues.	5th	CACTOMANIACS Meeting	8 P.M.
Wed.	6th	CLASS—Deserts, How Formed and their Plants	3 P.M.
Thurs.	7th	LECTURE—Arizona Cacti in Flower	3 P.M.
Sun.	10th	LECTURES—Arizona Wildflowers	3 & 4
Wed.	13th	CLASS—Desert Succulent Plants	3 P.M.
Thurs.	14th	LECTURE—Arizona Wildflowers	3 P.M.
Sun.	17th	LECTURES—Arizona Trees & Shrubs in Flower	3 & 4
Wed.	20th	CLASS—Culture of Desert Succulent Plants	3 P.M.
Thurs.	21st	LECTURE—Arizona Trees & Shrubs in Flower	3 P.M.
Sun.	24th	LECTURES—Arizona Birds & Animals	3 & 4
Wed.	27th	CLASS—Identification of Desert Trees & Shrubs	3 P.M.
Thurs.	28th	LECTURES—Arizona Birds & Animals	3 P.M.
Sun.	31st	LECTURES—Arizona Scenics	3 & 4